212-04: ANALYSIS OF CURRENT INDUSTRIAL LAND USE

04-01: Introduction

Industrial land use is enabled by zoning, a local government responsibility. However, industrial development potential transcends municipal boundaries and is affected by regional factors such as population, labor force, infrastructure capacity, and employment mix. Planners can define "region" in different ways; what we prefer for the purposes of this *Industrial Land Use Plan* is the *Substate Employment Growth Area,* a discrete unit made up of neighboring communities that share certain characteristics defining an economic base. The Substate Growth Areas take in communities normally associated with regions of Rhode Island, such as the Blackstone Valley, the West Bay, or Aquidneck Island.

04-02: Delineation of Substate Employment Growth Areas

In the late 1980s, an Industrial Land Use Advisory Committee was assembled to help Statewide Planning identify industrial development opportunities and constraints related to land use. The Advisory Committee delineated Substate Employment Growth Areas from Statewide Planning's population projections and employment forecasts. ((4)) After considering a variety of past, current, and future labor and industry statistics, as well as the less quantifiable cultural and historical relationships among Rhode Island's 39 cities and towns, the Advisory Committee described eight such areas (see Figure 212-04 (1)). We have retained those eight designations in this version of the *Industrial Land Use Plan.* ((104))

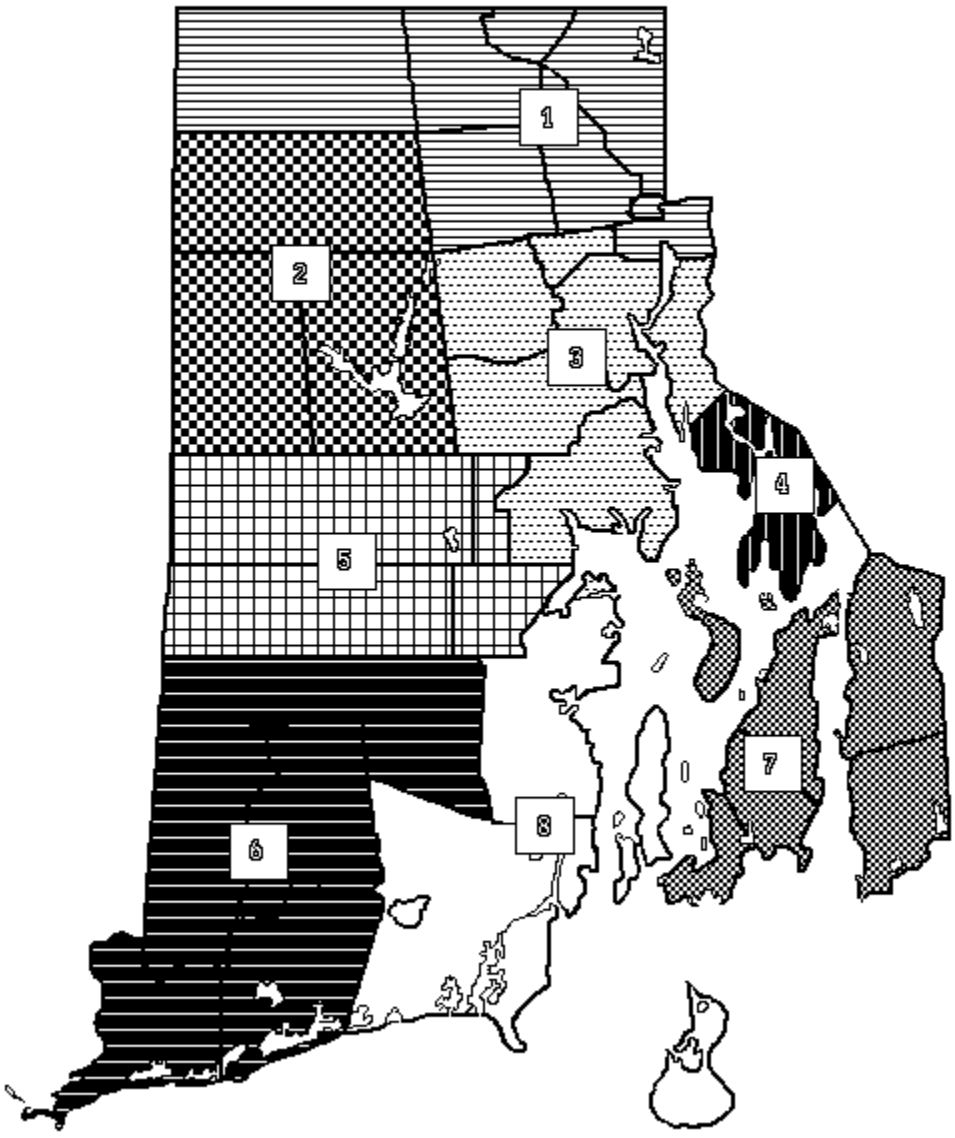
04-03: Methodology

Gathering the necessary information on industrial sites drew upon the inventory assembled for the original version of this plan. This was a cooperative effort between Statewide Planning staff and local planners.

The starting point was a technical paper, *Land Zoned for Industrial Use,* which depicted the configuration, use, size, and characteristics of 283 sites zoned industrial in Rhode Island as of 1977. ((62)) In the summer of 1988, the Division of Planning — as Statewide Planning was called at that time — reviewed the site maps with planning contacts in the communities to note necessary additions, deletions, or other corrections. In addition, every local planning department or planning board chairperson was sent a survey requesting information on the community's economic development goals, assets, and limitations. A similar survey was sent to over 30 local and regional economic development organizations.

Statewide Planning contacted the communities in 1996 and again in 1998 to update the industrial site inventory. Local planners were consulted, along with Statewide Planning's Local Planning Assistance Section (formerly part of the

FIGURE 212-04(1):
RHODE ISLAND'S SUBSTATE EMPLOYMENT GROWTH AREAS



Office of Municipal Affairs), and the communities' comprehensive plans were reviewed. As corrections were being made to the industrial site inventory, the revision of the *Industrial Land Use Plan* was begun.

Staff of the Economic Development Section of Statewide Planning produced maps of industrial sites depicting industrial development potential (IDP) according to a progressive classification system. Five IDP classifications were adopted:

- IDP-0(d): *Fully developed.* No vacant (undeveloped or cleared) land is available.

- IDP-0(r): *Recommended for rezoning (or already rezoned).* Developed primarily with incompatible uses, e.g., residential, recreation, or landfill, or with predominant site features that cannot be reasonably mitigated by infrastructure. Such site features might include poor soils, presence of a primary recharge area, wetlands, flood hazard, presence of prime agricultural land, or presence of a unique natural area.

- IDP-1: *Low potential.* Development or expansion of existing use may be appropriate based on good highway access or other unique features, but is likely to be severely limited by very small available area, lack of infrastructure, and/or the presence of poor soils, groundwater aquifers, wetlands, or a flood hazard area.

- IDP-2: *Moderate potential.* Site may support development or expansion of existing use at a "light" or moderate level, as determined by the site's size, accessibility, and level of infrastructure, and the degree to which poor soils, aquifers, wetlands, and flood hazards can be avoided.

- IDP-3: *High potential.* Site has sizeable vacant parcels, public water, public sewer, good access, and no limiting physiographic features.

The staff used the R.I. Geographic Information System (RIGIS) and its PC-based counterpart, Maptitude®, to develop the maps. Eight maps resulted, one for each Substate Growth Area. These maps are included in the discussion of each area that follows.

The maps have a point overlay added to locate CERCLIS sites that are on the Department of Environmental Management's "active list" and sites that are on the Environmental Protection Agency's National Priority List (NPL). This includes properties at which environmental contamination is suspected or has been noted, but not yet remediated, thus presenting a likely delay in development. This does not preclude future use following remediation. In fact, elsewhere in this document, we presume remediation is feasible. Presenting the CERCLIS/NPL sites as an overlay labeled "Cerclis Sites" is intended to allow a peek below to assess site potential absent the contamination.

04-03-01: Population and Employment

For an assessment of population and employment trends in the individual Substate Growth Areas, staff used both published data and in-house regression analyses dating from 1975 and extending to 2020. Population projections beyond 1990 were derived from the May 1997 report, *Rhode Island Population Projections by Age, Sex, and Race 1995-2020 (Revised).* Regression analyses for employment were based on data depicting private employment covered by Rhode Island's Employment Security Act provided by the R.I. Department of Labor and Training (DLT). The employment figures represent the number of jobs within a Substate Growth Area, *not* the number of residents of that Substate Growth Area with jobs. Some of the jobs so enumerated may be held by non-residents. An employment-to-population ratio was calculated as a measure of growth.

We made the decision to use "covered employment" because of the access we had to such information from the DLT on both a statewide and community basis, which was necessary for our analysis by Substate Growth Area. Using an in-house regression analysis kept the methodology simple and easy for others to replicate.

An alternative would have been to use data from the Bureau of Economic Analysis (BEA), a part of the U.S. Department of Commerce, which projected employment to the year 2045 that included the self-employed and government employees. We decided against using the BEA data for three reasons: first, because they were derived by a complex model over which we had no control and which did not generate employment data by community; second, the figures were rounded (presented "in thousands") so that small changes could not be discerned, even though, after a 25-year period, they could represent a significant trend; and third, they did not provide data back to 1975 that we felt were necessary to fit into the historical perspective of industrial land use described in the *Industrial Land Use Plan.* ((7))

A cautionary note is appropriate here regarding our projections of employment. Our regression analysis is based on employment numbers from the years 1975-1995. In some of the Substate Growth Areas, these numbers have established a downward trend in one sector, manufacturing, that in regression analysis theory would be expected to continue through 2020. If the trend in employment in a given sector is steadily downward, eventually it will disappear in the analysis — so in some cases it will even seem that beyond the year 2020 manufacturing employment will "zero out."

Regression analyses are based on historical data, not on options or possibilities that have not been fully realized. That is how the mathematical relationships in regression analyses are established that allow projections to be made. Regression analysis is therefore a reliable and easily replicable method of making a projection — in our case, future industrial land needs. This is a great strength of the method, but it is also a limitation. Regression analyses cannot account for circumstances that may reverse a trend until they actually occur. Projections made by regression analyses therefore can never be considered etched in stone because circumstances can certainly change.

As more information becomes available over the years, it should be subjected to a new regression analysis so that any employment or population trend that will

affect the industrial land use projections will be discovered. Even then, it will be important to remember that the trend will only reflect circumstances *at the time the analysis is made.* The analysis must always be kept fresh and current to have any claim of accuracy.

04-03-02: Site Suitability Analysis Using the Industrial Land Inventory

The staff's analysis of the industrial land inventory used the following procedure to evaluate sites in the eight Substate Growth Areas. Accessibility was characterized by a site's distance from state and interstate highways and state airports. The existence of rail lines or spurs was noted, although no effort was made to determine the status of rail service. Information on utility services was assessed to describe the availability of public water, sewerage, and natural gas at each site. (Electricity was assumed to be universally available.) Physiographic features were considered that would inhibit development, such as slope and wet or rocky soils, as well as wetlands and flood hazard areas.

A screen was applied to each industrial site with vacant acreage. Development potential was determined by the presence of utility service and the absence of physiographic, size, shape, or access constraints. *This was an "all-or-nothing" evaluation.* Even if just a small portion of the site had a sensitive environmental feature that at least theoretically could be avoided or mitigated, the *entire* site was considered constrained, and *all* its acreage was trapped in our screen. A site-by-site analysis was made subsequently in each Substate Growth Area to discuss other possibilities if more detailed information was available.

04-04: Results of the Preliminary Analysis

The inventory phase identified 336 industrial-zoned sites in 39 communities. The land area these sites encompassed was 32,455 acres. This represented an increase in the number of sites from 1977 (283 sites) and 1988 (328 sites), but a decrease in acreage (compared to 35,403 acres in 1977 and 35,186 in 1988). Refer to Figure 212-04(2).

The staff also determined that the amount of industrial-zoned land *in industrial use* has steadily increased since 1977, amounting to a gain of 4,360 acres over 20 years — even though manufacturing jobs traditionally associated with industrial areas have been lost. Industrial-zoned land in use other than industrial (e.g., commercial or residential) has decreased by 1,819 acres. Vacant industrial acreage has decreased by 5,485 acres. See Table 212-04(1). These trends suggest that the majority of the industrial acreage that was formerly vacant has gone into industrial use and the rest has been rezoned. Formerly vacant industrial land has apparently not fallen into other use by special exception. This follows a key

TABLE 212-04(1):
INDUSTRIAL-ZONED LAND IN RHODE ISLAND
AND ITS USE, 1977-1999

	1977		1988		1999	
Total sites zoned industrial	283		328		336	
	Acres	**%**	**Acres**	**%**	**Acres**	**%**
Total land zoned industrial	35,403	100	35,186	100	32,455	100
Existing use:						
Industrial	6,756	19	9,884	28	11,116	34
Other	7,938	22	7,720	22	6,113	19
Vacant	20,709	59	17,582	50	15,224	47

Source: Statewide Planning Program Industrial Land Inventory (1997-99). Totals may vary due to the rounding of fractions of acres to the nearest whole number.

recommendation of the first *Industrial Land Use Plan* for use to correspond properly with zoning.

04-04-01: Amenities at Industrial Sites

Finding that there is currently a total of 32,455 acres zoned industrial does not mean that all the acreage is conducive to industry. Vacant parcels may be shaped oddly or be too small to be viable as an industrial site; others may not be accessible by highway or airport; still others may lack public utilities, or may have unfavorable physiographic features. Some may be unremediated brownfields and/or CERCLIS sites, e.g., abandoned dumps.

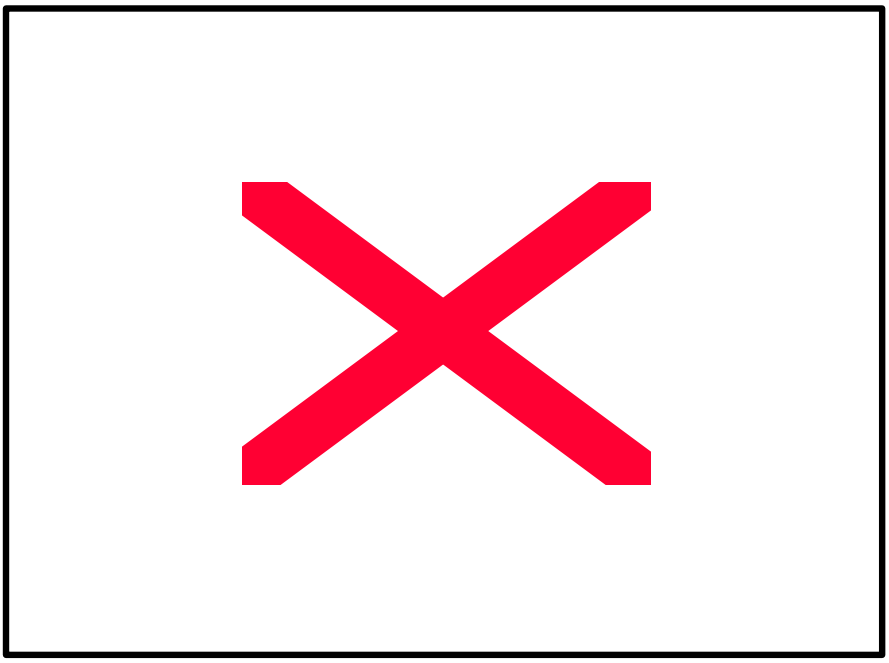
Table 212-04(2) and Figure 212-04(3) present the results of our analysis of constraints to development on industrial-zoned land, and compare them to data from 1977 and 1988. There is clearly some double counting, with some sites showing both natural constraints and the absence of utilities.

The staff found that only 1,485 vacant acres in total would fit the definition of prime industrial land, with public water, sewers, and no physiographic constraints to construction (soil, topographic or flood hazard concerns) or other site-specific problems, such as odd configuration or lack of access. See Table 212-04(3), p. 4.8. Of this total, six sites with 676 vacant acres in total had environmental liability concerns, with portions of the sites on the CERCLIS list.

04-04-02: What Do These Findings Mean?

This level of analysis can present only a broad overview of the capabilities of Rhode Island's industrial land. It is intentionally conservative in its assessment

FIGURE 212-04(2):
INDUSTRIAL-ZONED SITES AND ACREAGE IN RHODE ISLAND, 1977-1999



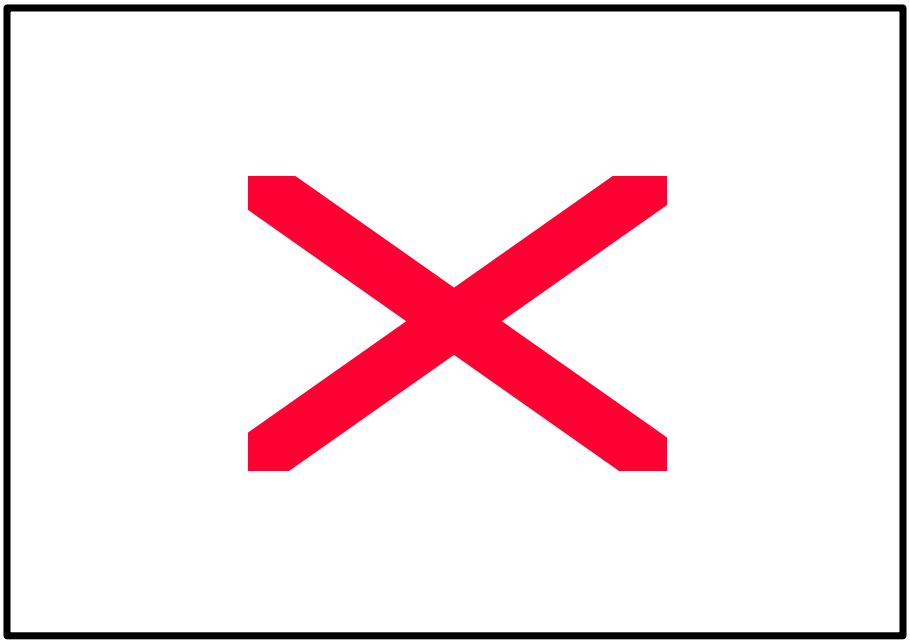


TABLE 212-04(2):
INDUSTRIAL SITE CONSTRAINTS, 1977-1999

	1977		1988		1999	
	Sites	Acres	Sites	Acres	Sites	Acres
Total sites zoned industrial	283	35,403	328	35,186	336	32,455
Without water	50	9,719	57	6,774	54	4,277
Without sewer	113	18,365	123	17,224	119	11,429
Without gas	69	11,426	79	8,964	82	6,733
Over 5 miles from highway	86	13,162	126	13,214	1	114
Over 5 miles from airport	232	25,987	136	14,597	268	23,698
Without rail access on site	200	21,679	226	20,220	226	17,826
Flood hazards	102	10,416	138	18,193	87	10,710
Major soil/topo. limitations	69	17,306	122	24,121	96	18,456

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

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of what constitutes a prime industrial site. At a greater level of detail, such an assessment might consider a site's suitability for certain types of development in spite of physical constraints or the absence of utilities. (For example, what is the nature of the industry? What would be the demand on the land? Would there be high or low employment densities? Could the developer compensate for the lack of infrastructure? Could utility service be expanded to those sites? Is it possible to regroup and configure fragmented parcels to utilize them more effectively?) Where possible, we make that analysis in the section that follows. We also presume that all CERCLIS sites can and will be remediated, making that constraint to development a temporary one – though something appropriate to flag to show that not all prime sites are construction-ready.

TABLE 212-04(3):
VACANT SITE SUITABILITY ANALYSIS

	1977		1988		1999	
	Acres	%	Acres	%	Acres	%
All land zoned industrial	35,403	100	35,186	100	32,455	100
All vacant land zoned industrial[1]	20,669	58	17,582	50	15,224	47
Vacant industrial land w/public water[2]	12,027	34	11,933	34	11,957	37
Vacant industrial land w/public water & sewer[2]	6,852	19	5,134	15	7,727	24
Vacant industrial land w/public water & sewer, no physiographic constraints ("prime")[2]	1,304	4	1,948	6	1,485	6
Prime vacant industrial land on active CERCLIS sites[2]	n/a		n/a		676	2

[1] Where "vacant" is defined as *undeveloped* or *cleared*, as opposed to *abandoned*.
[2] Double counting occurs among these categories, yielding a sum greater than the total.

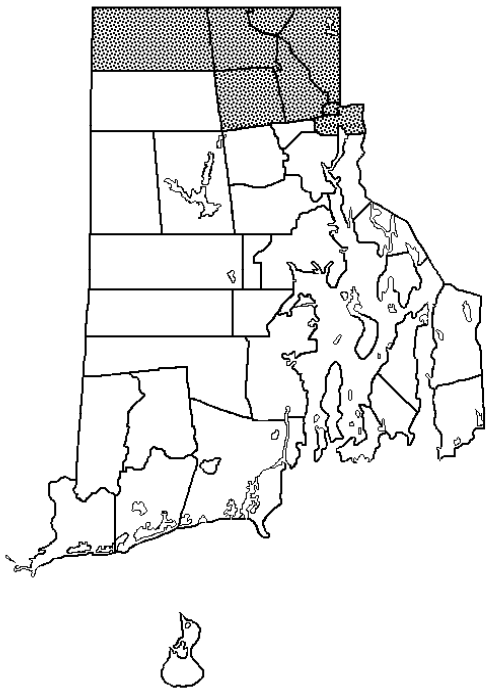
Source: Statewide Planning Program Industrial Land Inventory (1997-99); RIGIS (1999)

FIGURE 212-04(3):
INDUSTRIAL SITE CHARACTERISTICS, 1977, 1988, 1999

04-05: Analysis of Substate Employment Growth Areas

Eight Substate Employment Growth Areas have been delineated, drawing from the economic units identified in the 1990 version of the *Industrial Land Use Plan.* Growth in population as well as employment is analyzed.

04-05-01: Substate Employment Growth Area 1



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	217,800	107,608	59,781	0.27
1980	218,153	"	71,760	0.33
1985	222,100	"	72,305	0.33
1990	227,131	"	74,300	0.33
1995	225,516	"	73,735	0.33
2000	227,603	"	79,511	0.35
2005	228,332	"	82,555	0.36
2010	228,676	"	85,600	0.37
2015	229,266	"	88,645	0.39
2020	230,713	"	91,690	0.40

04-05-01-01: Demographic Profile

Substate Employment Growth Area 1 is comprised of eight communities: Burrillville, Central Falls, Cumberland, Lincoln, North Smithfield, Pawtucket, Smithfield, and Woonsocket. It is one of the largest Substate Growth Areas, in terms of land area, at 107,608 acres.

This Substate Growth Area has a population density of 2.11 persons per acre, which is substantially more than the state's average. This reflects the urbanized nature of three of its constituent communities — Central Falls, Pawtucket, and Woonsocket. While these three cities have decreased in population from 1985 to 1995, the Substate Growth Area as a whole has gained and is expected to continue gaining population through 2020. This will occur, however, at a slower rate than the rest of the state; from 1995 to 2020, population will increase by 2.3 percent, or a mere 0.09 percent per year.

Employment, on the other hand, is expected to grow by nearly 18,000 jobs from 1995 to 2020, an increase of 24.4 percent over the 25-year period, or 0.97 percent per year. The ratio of employment by establishment in the substate area to resident population (E/P) will grow 21 percent from 1995 to 2020, or about 0.84 percent per year. This calculation is a convenient indicator of the status of Substate Growth Area communities as "bedrooms" for other areas (low E/P), or as economic engines themselves (high E/P). Our forecast predicts slow growth in the E/P after the 1980-1995 plateau, and a relatively high E/P by 2020.

04-05-01-02: Economy

The largest employment sectors in Substate Area 1 are manufacturing, wholesale and retail trade, and services. In the manufacturing sector, fabricated metal products (SIC 34) are a major industry; industrial and commercial machinery and computer equipment (SIC 35) and miscellaneous manufacturing (SIC 39) follow. Textile mill products (SIC 22) have been and remain a major player in the older industrial communities of Central Falls, Pawtucket, and Woonsocket. Primary metal industries (SIC 33) are strong in Lincoln and Pawtucket, chemical and allied products (SIC 28) in Cumberland, instruments and related products (SIC 38) in Smithfield, and rubber and plastic products (SIC 30) in Woonsocket.

In spite of an areawide strategy to retain and even expand manufacturing, the manufacturing sector is declining. Certain industries, however, are enjoying spurts of growth in individual communities: industrial and commercial machinery in Cumberland, rubber and plastic products in Pawtucket, food and kindred products (SIC 20) in Smithfield, and specialized textiles in Woonsocket. ((63))

Durable goods (SIC 50) dominate wholesale trade in Substate Growth Area 1. In retail, eating and drinking places (SIC 58) lead, followed by food stores (SIC 54) and miscellaneous retail (SIC 59). ((63))

Health services (SIC 80) account for the biggest share of services employment in Substate Growth Area 1, followed by business services (SIC 73). More modest numbers but pronounced growth is evident in engineering and related services (SIC 87). Amusement and recreation services (SIC 79) is high and apparently growing in Lincoln. ((63))

Statewide Planning's regression analysis of employment data from 1975 to 1995 projects manufacturing will decrease by 9,657 jobs from 1990 to 2020. Wholesale and retail trade will grow by slightly more than that amount, while services will account for the greatest job growth, at more than 14,500 jobs. The year 2000 will mark the date that services overtake wholesale and retail trade. Services will overtake manufacturing as the main source of employment in Substate Growth Area 1 in 2005. By 2010, manufacturing will be in third place behind wholesale/retail.

These trends are summarized by decade from 1990 to 2020 below. In the wholesale/retail mix, about 23 percent of the jobs will be in wholesale trade. ((64))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	31,310	27,756	24,704	21,653	- 9,657
Wholesale/retail	18,089	22,322	25,190	28,059	+ 9,970
Services	17,724	22,563	27,427	32,290	+14,566

04-05-01-03: Infrastructure

Substate Growth Area 1 takes in the Blackstone Valley. With its headwaters in Worcester, Mass., the Blackstone River flows southeasterly to its mouth in Pawtucket. It was at the Pawtucket Falls in 1790 that Samuel Slater harnessed the power of the Blackstone to mechanize a system for spinning cotton, catalyzing America's Industrial Revolution. Reflecting this heritage, the Blackstone Valley continues to be characterized by a series of mill villages. The area becomes more rural as one moves farther west of the river.

Transportation: The area has good access to interstate highways, with I-95 serving as the main north-south route and I-295 acting as a beltway around the Providence metropolitan area. Rhode Island Routes 146, 7, 116, 122, and 102 are also major roadways. A variety of land uses are supported along them.

The I-295/R.I. 146 interchange has been the focal point of extensive commercial and industrial development. In addition, R.I. Route 99 provides an artery between this interchange and the Cumberland/Woonsocket area, particularly the Highland Industrial Park that straddles the two communities.

Almost the entire Blackstone Valley is serviced by the Providence and Worcester Railroad. Freight service is provided off the P&W's mainline, which bisects the valley along the riverbed of the Blackstone.

The North Central State Airport is the area's general aviation facility. ((11:4.9))

Water: The area's utilities range from full service — or virtually full service, with the exception of isolated blocks — in Pawtucket, Central Falls, Lincoln, and Woonsocket, to limited service in smaller, less developed towns. There are ten public water systems serving the area.

The entire City of Pawtucket is served by the municipal water system, which also provides water to Central Falls and the southern portion of Cumberland. Woonsocket is also fully served by its own system, and provides water to Union Village in North Smithfield and to a small section of Cumberland. Smithfield has one private and two public water systems, all of which draw their supplies from the Providence system. These systems combine to serve the southern and central areas of the town.

Lincoln, like Smithfield, relies on the Providence system for its water supply but has expanded service to practically the entire town. Lincoln has a history of encouraging industries to supply their own process water; this was due originally to contaminated wellfields, but now serves as a conservation measure and to mitigate the relatively low pressure of the extended Providence system.

Cumberland operates its own system that serves a small area from both surface water and groundwater supplies. Burrillville has two water systems that serve the villages of Pascoag and Harrisville through wellfields of limited expansion potential. ((11:4.9-4.10))

Sewers: Like water, sewers are available to virtually all areas of Pawtucket, Central Falls, Lincoln, and Woonsocket; elsewhere in the Blackstone Valley, service areas are limited to the more populated villages. Burrillville's sewered areas service the central part of the town, i.e., the villages of Pascoag and Harrisville, and the Spring Lake area. North Smithfield has sewers in Slatersville and Union Village. Smithfield's southern villages are sewered, as is a portion of the Smithfield Industrial Park. Cumberland's sewer service is limited to the southwestern portion of the town. ((11:4.10-4.11)), ((78))

The Blackstone Valley District Commission formerly operated the system that serves Pawtucket, Central Falls, Lincoln, and Woonsocket, and portions of Cumberland and Smithfield. It merged several years ago with the Narragansett Bay Commission.

04-05-01-04: Site Analysis

Reflecting its manufacturing history, Substate Growth Area 1 has 7,911 acres in total zoned for industrial use. This accounts for 24 percent of the state's total industrial-zoned land. The acreage actually in industrial use in the area — as opposed to residential or commercial use — represents 27 percent of the state's land in industrial use. Both figures are disproportionately high for a region that encompasses but 16 percent of Rhode Island's land area.

More than half of the substate area's industrial-zoned land, 4,133 acres, is vacant (undeveloped). This represents a substantial portion, 27 percent, of the state's

total vacant industrial land. In addition, this substate area possesses the largest share, 40 percent, of the state's vacant industrial land considered *of highest Industrial development potential* — with utilities, sizeable parcels, and no physiographic or environmental constraints (e.g., floodplains or wetlands). ((65))

Table 212-04(4) summarizes these findings. A town-by-town analysis follows.

Burrillville: The Town of Burrillville, in the extreme northwest corner of the state, has 11 sites set aside for industrial development, totaling 530 acres. While five sites have vacant industrial acreage, three have soil or topographic constraints that may hinder development, and two lack public water (although they have sewers and are near public water lines).

Only one of the vacant sites is fully serviced and is not limited by a physiographic or environmental concern. That site contains four vacant acres suitable for expansion of existing use. It is mostly developed with old textile

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TABLE 212-04(4):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 1

City or Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Burrillville	530	105	84	341	0
Central Falls	111	81	28	2	0
Cumberland	1,023	480	198	345	135
Lincoln	1,406	748	123	535	92
No. Smithfield	593	245	11	337	303
Pawtucket	862	544	270	48	0
Smithfield [2]	2,718	306	79	2,333	48
Woonsocket	668	465	11	192	18
Total	**7,911**	**2,974**	**804**	**4,133**	**596**
State total	32,455	11,116	6,113	15,224	1,485
% state total	24.38	26.75	13.15	27.15	40.13

[1] All values are in acres, with the exception of "% state total." Use totals may be greater than total acres due to rounding of fractional acreage to nearest whole number.
[2] Use data for the Town of Smithfield were incomplete. Statewide Planning Program staff derived these figures from plat maps provided by the town. See note in Table 212-04(5).

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

buildings, some of which contain vacant leasable space. Unfortunately, the site lacks adequate parking for full redevelopment of the existing buildings.

A second site, with two vacant acres — the Burrillville Industrial Park — lies over an aquifer recharge zone and within an overlay protection district. The park is about 95 percent occupied, and features a 10,000 sq. ft. "spec" building.

A third site with vacant acreage comprises the largest industrial zone in the town, some 258 acres, and is almost entirely vacant. Public water can be made available to the site from an abutting subdivision (Lynmar Estates). There are some wetlands in the front of the property. The site includes four 3-4 acre lots fronting on R.I. Route 102, one of which has a vacant/underutilized building.

Another largely vacant site is shared with the former landfill (now capped and closed), the sewage treatment plant, and the dog pound. This site is also very close to the public water supply, and the water line is likely to be extended onto the site. Access is somewhat restricted in that tenants will need to obtain the town's permission to use Clear Water Drive, a private way, to gain access to Route 102. Alternatively, the Town Council may be petitioned to accept Clear Water Drive as a public street. There are slopes on the site, but they may not constitute a serious constraint to development. ((72))

The fifth site is an abandoned excavation pit located on R.I. Route 7 (Douglas Pike), where a small building and excavation hardware remain. It is available for sale or lease. A small portion of the site is the former Western Sand and Gravel Superfund site but the remainder is redevelopable. Monitoring wells exist on-site to test for groundwater contamination.

Of the six fully-occupied sites, two sites are in full industrial use; one site is located on the Slatersville Reservoir, and is predominantly (almost fully) in non-industrial use; and the remaining site is split almost evenly between industrial and non-industrial uses. It has been recommended that the site in mostly non-industrial use be rezoned.

Central Falls: The City of Central Falls has only 111 acres zoned industrial, the least of the eight Blackstone Valley communities, but accounting for nearly one-sixth of the city's total land area.

Almost every industrial site in Central Falls is fully occupied. Four are devoted to full industrial use; three are predominantly industrial; one is predominantly non-industrial, and contains two vacant acres. Portions of the latter site have been redirected to "Urban Conservation" and "Planned Unit Development" zones, considerations viewed as impediments to further industrial development.

All of the city's industrial sites are fully serviced with excellent transportation access, and none have physiographic or environmental constraints. However, the virtual unavailability of vacant acreage in the city is likely to limit industrial expansion to existing, underutilized buildings. ((8))

Cumberland: The Town of Cumberland has 15 industrial sites amounting to 1,023 acres. Nine of these sites are fully serviced and have excellent transportation access; natural gas is available at all sites but one.

Ten of the 15 sites are fully occupied, including five sites that are not sewered. Of these ten, nine are in full industrial use.

Each of the remaining five sites has from 15 to 120 vacant acres. Two sites are constrained by floodplains; one of them also has unfavorable soil and topographic conditions. A third site, with 120 vacant acres, has no such constraints but lacked both sewer and water until recently. This is the site of the "Highland II" complex, part of a large industrial park straddling Woonsocket and Cumberland on R.I. Route 122, near the terminus of Route 99. Highland II is now fully serviced, with sewer, water, and natural gas. ((68))

Two other sites have full utilities and no apparent environmental constraints: the Valley Gas Company headquarters site on Route 122 with 15 vacant acres, and a 157-acre site at the intersection of Route 122 and Angell Road with 110 vacant acres. The latter is home to a sand and gravel excavation business. Its development potential depends partly on what its condition would be if the excavation operation ended. ((8))

Lincoln: The Town of Lincoln has 1,406 industrial-zoned acres spread over eight sites, all of which are fully serviced and have good or excellent transportation access. Two of these sites are fully occupied, predominantly with industrial uses. The remaining six have vacant acreage ranging from 17 to 211 acres, and non-industrial as well as industrial uses.

The first of these six, located on Manville Road along the Blackstone River, has 42 vacant acres, but has been deemed impractical for industrial development because of its narrow configuration, occupation by a railroad right-of-way, and flood hazard. Another site, on R.I. Route 116 and offering 211 vacant acres, is characterized by rocky soils, limited access through a residential area, and prior use as a gravel pit that may add to development cost.

Floodplains or soil and topographic constraints limit development on three other sites in Lincoln that together account for 190 vacant acres. One of these sites has excellent highway access, however, being located at the intersection of Routes 116 and 146.

The one site most apparently favorable to development in Lincoln is actually an extension of the last site described above. It is being developed rapidly as a business park. The most recent estimate (1996-97) of vacant land at this site was 92 acres, all of which meet the qualifier in Table 212-04(4) of "high potential." Transportation access is outstanding among industrial sites, being within one mile of state highway, interstate highway (I-295 leading to I-95), and North Central State Airport. ((8))

North Smithfield: The Town of North Smithfield has four industrial sites, only one of which is fully serviced. This site includes the Greater Woonsocket Industrial

Park and is located at the intersection of R.I. Route 5 and School Street. It has 303 vacant acres, natural gas service, and rail access. Several manufacturing buildings exist on this site, one of which has approximately 120,000 sq. ft. of available space. Two other buildings need extensive renovation but could be rehabbed for industrial uses.

One of the remaining sites are fully occupied and in industrial use. Another site, measuring 10 acres, is entirely vacant, but constrained by flood hazard, soil and topographic limitations, poor access, and a lack of sewerage. This site is located just south and west of the intersection of Route 122 and the Massachusetts line.

The fourth site has moderate development potential, with sewer, electricity, and natural gas, and water in close proximity and soon to be extended to the site. All of the site's 24 acres are vacant and are being marketed for sale as land for "manufacturing."

North Smithfield's industrial sites, occupied and vacant, total 593 acres. ((8))

Pawtucket: The City of Pawtucket has 862 industrial-zoned acres located at 15 sites. Five of the 15 sites are fully occupied; all but one of the 15 sites is fully serviced (it lacks sewers). All Pawtucket sites are within 1-5 miles of state or interstate highways. Some have problems with access to and from the site, however, being surrounded by other, primarily residential uses. Parcels tend to be small. Altogether in the city there are only 48 vacant acres, about 5.6 percent of the total industrial acreage.

Three sites have soil and topographic constraints; one of these, located along the Moshassuck River, also has floodplain concerns. That site is known as the Moshassuck Valley, and encompasses an enterprise zone; its vacant land amounts to 14 acres. Another site (at the intersection of Roosevelt Avenue and East Street) has four vacant acres, but they are not considered developable.

The seven remaining sites have vacant acreage ranging from one to nine acres. At one of these sites, at the intersection of Pleasant and Division Streets, the vacant acreage is being considered for residential development. Most of the other sites suffer from fragmentation and the availability of only small parcels, making them suitable only for expansion of existing uses or very small-scale development. They are also likely to be surrounded by non-industrial and potentially conflicting uses. ((8))

Smithfield: There are seven industrial-zoned sites in Smithfield, nearly all with moderate or high development potential. With the exception of one site on Farnum Pike (Plat 46/49), all have the full suite of utility services, including natural gas. None have rail access, however. One site, on Albion Road, is fully occupied.

Among the Smithfield sites is the largest industrial site in the state, located northeast of the intersection of Douglas Pike and R.I. Route 116. It measures 2,410 acres in total, with 155 acres in industrial use, 38 acres in non-industrial use, and 2,217 acres vacant. Conditions there range from fairly level and well drained to steeping sloping and swampy. The majority of the vacant acreage is rocky and would require considerable preparation. The site is therefore considered of moderate potential.

Other Smithfield sites have vacant acreages ranging from eight to 39 acres. Three sites are considered of high potential: Plat 17, Sprague ville and Mountaindale Roads; Plat 25/16, Farnum Pike; and Plat 37, Cedar Swamp Road.

Woonsocket: The City of Woonsocket is known for its mill buildings, some of which form sprawling complexes in various states of use or disrepair, or in very creative reuse (such as the Museum of Work and Culture). Woonsocket has 668 industrial-zoned acres, only 11 acres of which are in non-industrial use. ((66))

The city has 14 industrial sites, three of which are fully occupied (including the Woonsocket side of the Highland Industrial Park). These three sites account for 270 acres. Of the remaining 11 sites, five have environmental constraints (two with flood hazard potential, one with wetlands, and two with steep slopes and rocky soils). Nearly all sites are characterized by the presence of mill buildings, and most offer the opportunity only for expanding existing uses rather than locating new ones because of small parcels and modest acreage. All are fully serviced, all are within a mile of a state highway, and five have rail access.

One site with what at first appears to have potential for new industrial development is the Cherry Brook area, with 25 vacant acres. However, this site is listed as possibly containing wetlands among its vacant acreage and so does not meet our criteria for high potential sites (which include no environmental constraints). Another site, along Cumberland Hill Road, offers 91 vacant acres, but features at least some rocky soils and steep slopes (soil/topography constraints).

Two other sites offer 18 and 20 acres respectively with no environmental constraints, but, again, feature small parcels located around existing mill buildings. Vacant parcels at the latter site, on Route 122, appear to have access problems as well. Unfortunately, siting problems at this level are not captured in our screen. ((8))

04-05-01-05: Summary of Industrial Land Use Potential

Substate Growth Area 1 is an interesting mix of communities, anchored by older urban areas with "mature" industrial buildings. These include not only the cities of Central Falls, Pawtucket, and Woonsocket, but also the distinct mill villages in each of the other towns. In these areas, the utility infrastructure is fully developed, with many sites having not only public water and sewers, but natural gas service as well. Some sites have rail access.

Those familiar with the first *Industrial Land Use Plan* will remember the plan's emphasis on reusing underutilized or vacant industrial space. Within the "built environment" of Substate Growth Area 1, communities are rising to the occasion and exploiting three distinct but related economic development opportunities — Rhode Island's enterprise zone, mill building reuse, and brownfields program.

Northern Rhode Island has been in the forefront of the enterprise zone program. Three of the original five enterprise zones are located in Substate Growth Area 1: Woonsocket/Cumberland, taking in downtown Woonsocket and the Highland Industrial Park; Central Falls/Cumberland, which includes the entire city of Central

Falls and the Valley Falls neighborhood of Cumberland; and Pawtucket/Lincoln, comprised of the Moshassuck Valley area.

A total of eight mill buildings have been certified by the Enterprise Zone Council for redevelopment in Substate Growth Area 1, one each in Burrillville and North Smithfield, and three each in Pawtucket and Woonsocket. The mill building reuse program is a direct offshoot of the enterprise zone program.

However, the built environment typical of the substate area's urban neighborhoods and enterprise zones also constrains industrial development. Surrounding uses may conflict with industrial activity and pose access problems — even though the areas may be only short distances from state or interstate highways. Vacant parcels may be small and scattered. Rocky soils, unfavorable topography, and Blackstone River floodplains may contribute to the problem and explain why some of the vacant parcels have remained undeveloped.

Our review of sites is similarly tempered in the more suburban or rural areas of Substate Growth Area 1. While there may appear to be more possibilities for industrial siting than in the fragmented urban areas, there are still only a limited number of sites that meet our criteria for truly high-potential, construction-ready sites. Lack of sewers may be one constraint, soil and topography another.

Table 212-04(5) gives a status report on infrastructure conditions on vacant industrial land in each of the communities in Substate Growth Area 1 and indicates where the highest-potential acreage may exist. Out of a total of 82 industrial sites covering more than 4,100 acres, only 808 acres, distributed throughout the substate area, have the utility service and lack of environmental constraints to be considered construction-ready. However, this acreage may be further constrained by lack of access, fragmentation of parcels, and room only to expand existing uses. The number should be compared with the "Vacant/High Potential" acreage listed in Table 212-04(4).

This point is made with more visual impact on Map 212-04(1), which shows the industrial development potential (IDP) of the area's industrial sites

TABLE 212-04(5):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 1

City or town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Burrillville	11	341	234	341	0	4
Central Falls	8	2	2	2	0	2
Cumberland	15	345	225	205	100	245
Lincoln	8	535	535	535	76	92
No. Smithfield	4	337	313	327	313	303
Pawtucket	15	48	48	48	28	30
Smithfield [1]	7	2,333	2,333	2,294	0	77
Woonsocket	14	192	192	192	132	55
Total	**82**	**4,133**	**3,882**	**3,944**	**650**	**808**

[1] 1996 use data, including vacant acreage, were not available from the Town of Smithfield. Figures here for the town were derived from town plat maps by Statewide Planning Program staff.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

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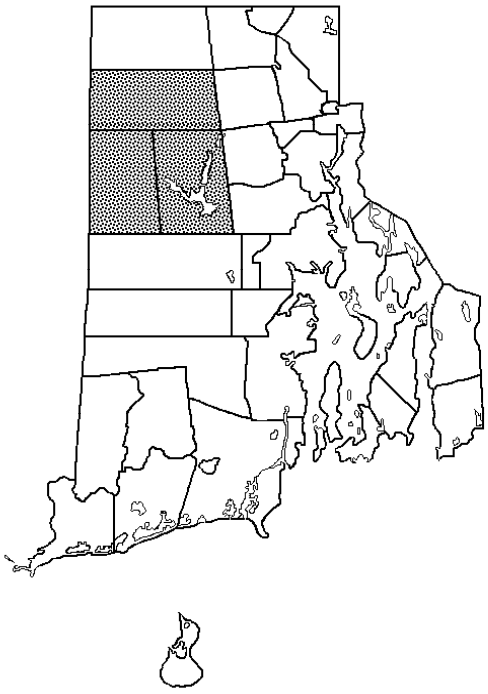
according to the scheme described in the Methodology on page 4.3 — IDP-1, IDP-2, etc. This map is found on the second page following. Sites with the highest development potential, ranked IDP-3, correspond with the "Vacant/High Potential" acreage given in Table 212-04(4). The "Cerclis Sites" overlay shows CERCLIS and NPL sites within and outside industrial sites in each community.

MAP 212-04(1):
SUBSTATE EMPLOYMENT GROWTH AREA 1

04-05-02: Substate Employment Growth Area 2



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	18,200	97,008	1,101	0.06
1980	19,325	"	1,280	0.07
1985	20,900	"	1,703	0.08
1990	23,339	"	1,890	0.08
1995	23,172	"	2,310	0.10
2000	24,632	"	2,565	0.10
2005	26,025	"	2,868	0.11
2010	27,444	"	3,171	0.12
2015	28,969	"	3,474	0.12
2020	30,865	"	3,776	0.12

04-05-02-01: Demographic Profile

Three towns comprise Substate Employment Growth Area 2: Foster, Glocester, and Scituate. At 97,008 acres, this substate area is one of the state's largest; at the same time, it has the lowest population density (0.24 persons per acre), reflecting its overwhelmingly rural character.

Substate Growth Area 2 is becoming increasingly suburbanized, with a population growth rate of nearly 11 percent from 1985 to 1995 — one of the highest

in the state. Employment growth in the same period was about 36 percent, *the* highest in the state. Even so, both the population density and the employment-to-resident-population ratio (E/P) are expected to remain the lowest in Rhode Island through 2020, maintaining the three municipalities' status as bedroom communities. The E/P is projected to grow 20 percent from 1995 to 2020, or 0.8 percent per year.

04-05-02-02: Economy

The three predominant employment sectors in Substate Growth Area 2 are services, wholesale and retail trade, and construction. Manufacturing is not among the top three industrial groups.

Health services (SIC 80) dominate the service sector areawide and are expected to continue growing. Social services (SIC 83) are second in employment, but should exhibit little or no growth. Business services (SIC 73) are third, with the most dramatic gains in growth taking place in Glocester and Scituate. ((63))

Durable goods (SIC 50) rank first in wholesale trade employment, which has slumped in all three communities. The highest retail employment is in eating and drinking places (SIC 58). Food stores (SIC 54) are second, followed by miscellaneous retail (SIC 59). ((63))

Special trade contractors (SIC 17) account for about three out of four construction jobs in Substate Growth Area 2; general building contractors (SIC 15) represent the remainder. Both have exhibited decreases since the building boom of the 1980s but are recovering somewhat. ((63))

Manufacturing, which slipped to fourth place among industrial groups in employment in1995, is dominated by fabricated metal products (SIC 34), primarily in Scituate. Nearly all manufacturing jobs in Foster are in lumber and wood products (SIC 24). ((63))

Even with the relegation of manufacturing to fourth place, that sector is expected to grow in the period from 1990 to 2020, adding 65 jobs — an increase of 25 percent. (It will, however, remain in fourth place according to our projections.) Construction as a whole will grow steadily in the same period, adding 171 jobs. This sector, holding third place, will have the second highest growth rate among area industries — 96 percent.

Wholesale and retail trade will increase by 324 jobs, or 52.5 percent. About 11 percent of the wholesale/retail jobs will be in wholesale trade. ((64))

The industry leader, by far, will continue to be services, which overtook wholesale/retail in 1995. This sector will increase by 995 jobs, or 171 percent, accounting for the most employment in Substate Growth Area 2 through 2020.

These trends are summarized below.

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Construction	200	238	330	392	+192
Manufacturing	260	278	301	325	+ 65
Wholesale/retail	617	661	829	941	+324
Services	582	959	1,268	1,577	+995

04-05-02-03: Infrastructure

Transportation: The communities in Substate Growth Area 2 do not have direct access to interstate highways, but can reach them via U.S. Routes 6 or 44 (west to I-395 in Connecticut, or east to I-295, and then to I-95), or R.I. Route 102 (south to I-95). These routes, respectively, provide the major east-west and north- south transportation corridors. Development along these highways is scattered and varied. This substate area is not serviced by rail or airport facilities.

Water and sewers: The rural character of the area and its low population density are reflected in the lack of a developed utility infrastructure to serve industrial sites. In almost all cases, both water and wastewater treatment need to be provided on-site. One of Scituate's industrial sites does have public water, but it is presently fully occupied.

04-05-02-04: Site Analysis

Table 212-04(6) indicates that, despite Substate Growth Area 2 being one of the state's largest in terms of land area, it has the least amount of acreage set aside for industrial use. We noted in the 1990 *Industrial Land Use Plan* that "a total

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TABLE 212-04(6):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 2

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Foster	111	0	22	89	0
Glocester	185	17	4	164	0
Scituate	28	27	0	1	0
Total	**324**	**44**	**26**	**254**	**0**
State total	32,455	11,116	6,113	15,224	1,485
% state total	1.00	0.40	0.43	1.67	0.00

[1] All values are in acres, with the exception of "% state total." Use totals may be greater than total acres due to rounding of fractional acreage to nearest whole number.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

of 315 acres divided among five sites has been designated for industrial use," and of that total, "253 acres remain vacant." ((11:4.19)) This is very similar to the situation today: there are six sites and a total of 324 acres, of which 254 are vacant. Lack of infrastructure and some environmental concerns, described in the community-by-community analysis below, impart very low potential to these sites for industrial development.

Foster: Foster's only industrial site, measuring 111 acres, is located at the intersection of R.I. Route 101 and Windsor Road. It has 22 acres in non-industrial use. Approximately 48 acres at the site has changed from "Manufacturing-Industrial" to "Agriculture-Residential." Development is further hampered by its lack of utilities and physiographic limitations. ((8))

Glocester: The Town of Glocester has two industrial sites, measuring 183 acres and two acres respectively. The larger site, on Sheldon Road, has 16 acres in industrial use and four acres in non-industrial use. While 163 acres remain vacant, there are several constraints to development. First, this site does not have frontage on a state highway. Second, no public utilities are in place or are likely to be provided. Third, the nearest interstate highway, rail line, or airport is 15 miles away. Fourth, the site adjoins a pond and contains streams with Class B water quality. The site also contains rocky and wet soils, with only small areas that do not have severe soil limitations.

The second site, located on Putnam Pike (Route 44), is occupied by four separate businesses in four buildings totaling about 16,000 sq. ft. The remaining space on the site is only suitable for expanding these buildings. ((8))

Scituate: The Town of Scituate boasts two fully-occupied industrial sites, measuring six acres and 19 acres respectively. The remaining site, south and east of the intersection of R.I. Route 116 and Danielson Pike, has a single acre vacant. Unfortunately, the vacant area contains wetlands and is not conducive to development. ((8))

04-05-02-05: Conclusions

The industrial development potential of Substate Growth Area 2 is severely limited by a lack of appropriate industrial acreage, a lack of infrastructure, relative remoteness compared to the rest of the state, and wet and rocky soils. The principal geographic feature of the area — a system of lakes and rivers that feed into Rhode Island's main potable water supply, the Scituate Reservoir — adds flood hazard concerns, plus concerns about protecting the reservoir watershed.

The job growth forecasted by Statewide Planning is modest enough to keep Substate Growth Area 2 the least "industrial" of the eight areas examined in this plan. Whether this growth can be accommodated by the area's presently tiny industrial land inventory will depend on the types of industries that grow within the broad industrial groups we surveyed, their demands on land, and if shortcomings in topography, soils, and infrastructure can be mitigated responsibly.

We expect there will be some flexibility in siting the leading disciplines within the service (health services) and construction sectors (special trade contractors — e.g., plumbers, painters, and electricians, who often work out of their homes). Similarly, one out of every four jobs in wholesale trade will be located on non-industrial land. ((11))

Table 212-04(7) confirms the dearth of construction-ready sites within the constituent communities. This is mirrored in Map 212-04(2), which describes the development potential of Substate Growth Area 2.

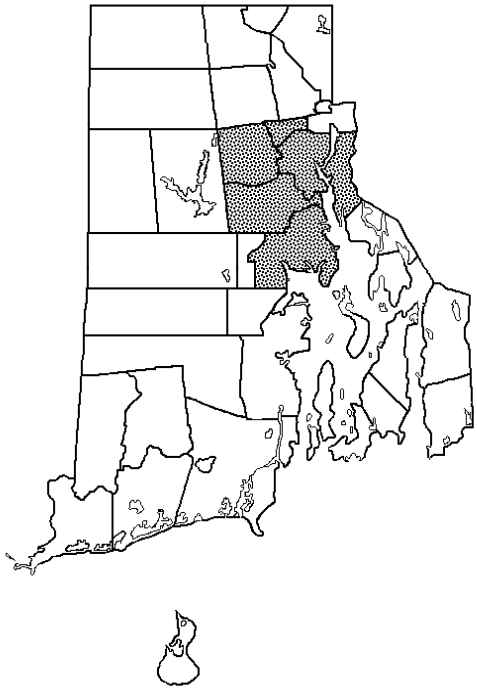
TABLE 212-04(7):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 2

Town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Foster 1	89	0	0	0	0	
Glocester	2	164	0	0	0	0
Scituate	3	1	0	0	0	0
Total	**6**	**254**	**0**	**0**	**0**	**0**

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

MAP 212-04(2):
SUBSTATE EMPLOYMENT GROWTH AREA 2

04-05-03: Substate Employment Growth Area 3



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	430,300	78,185	169,478	0.39
1980	420,994	"	185,892	0.44
1985	423,200	"	198,370	0.47
1990	431,227	"	199,260	0.46
1995	428,159	"	203,928	0.48
2000	427,511	"	216,066	0.51
2005	424,330	"	224,293	0.53
2010	420,473	"	232,520	0.55
2015	416,917	"	240,746	0.58
2020	414,524	"	248,973	0.60

04-05-03-01: Demographic Profile

Substate Employment Growth Area 3 includes six communities: Cranston, East Providence, Johnston, North Providence, Providence, and Warwick. Its 78,185 acres make it one of the smaller substate areas — but in 1995, with over 428,000 residents, it accounted for 43 percent of Rhode Island's population. This computes to a population density of 5.48 persons per acre, almost four times the state average.

This substate area is the most urbanized in the state, and can be considered Rhode Island's "metropolitan" area. Its population grew by 1.9 percent between 1985 and 1990, then began a decrease that is expected to continue through 2020. Modest

gains in Cranston, Johnston, and North Providence will be offset by losses in East Providence and Warwick, and particularly in Providence.

Supporting 203,928 jobs in 1995, Substate Growth Area 3 produced more than half of Rhode Island's "covered" private employment. The area's E/P ratio is the largest in the state, driving much of the state's economy. The ratio is expected to grow as employment grows through 2020 and the area's population shrinks.

04-05-03-02: Economy

In 1995, the largest private employment sectors in Substate Growth Area 3 were services, wholesale and retail trade, and manufacturing. Services overtook manufacturing as top employer by 1985; manufacturing moved to third place, after wholesale/retail, by 1990. The outlook is for manufacturing to continue to shrink while wholesale/retail and services grow strongly and steadily through 2020.

Within the manufacturing sector, miscellaneous manufacturing (primarily jewelry, SIC 391) is the areawide employment leader, followed by fabricated metal products (SIC 34), printing and publishing (SIC 27), and rubber and miscellaneous plastic products (SIC 30). Relatively large contributions to manufacturing employment were made by electronic and other electrical equipment and components (SIC 36) and furniture and fixtures (SIC 25) in Warwick. Industrial and commercial machinery and computer equipment (SIC 35) is the third largest employment generator in Cranston, following miscellaneous manufacturing and rubber and plastic products. ((63))

Manufacturing lost over 17,000 jobs in Substate Growth Area 3 from 1985 to 1995. In the same period, services gained over 22,000 jobs, while wholesale and retail trade trends followed the course of the regional economy, with losses in 1990 regained by 1995. The forecast through 2020 below is based on these trends. (But please heed the cautionary note given in the Methodology on page 4.4 about projections of dramatic decreases in employment in any one industrial sector.)

As in other substate areas, health services (SIC 80) are the major service industry. Areawide, business services (SIC 73) follow, and then social services (SIC 83). Social services may displace business services for second place in individual communities. Educational services (SIC 82) are at about the same level of employment as business services in Providence. ((63))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	44,314	31,660	17,817	3,974	-40,340
Wholesale/retail	45,560	51,948	57,092	62,235	+16,675
Services	74,025	95,868	118,149	140,430	+66,405

Durable goods (SIC 50) dominate employment in wholesale trade. Eating and drinking places (SIC 58), miscellaneous retail (SIC 59), and food stores (SIC 54) represent the most retail employment, in that order. In Warwick, general merchandise stores (SIC 53) make a major contribution as well. ((63)) About 24 percent of the wholesale/retail jobs will be in wholesale trade. ((64))

04-05-03-03: Infrastructure

Located in the virtual center of the state, Substate Growth Area 3 partially envelops Upper Narragansett Bay, the Providence River, and the Seekonk River. The commerce generated by these waterways greatly contributed to the early urbanization of this area. Today a substantial portion of the waterfront in both Providence and East Providence continues to support waterborne cargo. Farther south, harbors in Cranston and Warwick support both an active shellfishing industry and recreational boating.

Transportation: Substate Growth Area 3 has the most elaborate ground transportation system in the state. Interstate Route 95 provides the major north-south corridor, with I-195 and U.S. Route 6 serving east-west traffic. These routes are complemented by I-295, which acts as a beltway around the western side of the metropolitan area. Other major arteries include the north-south Routes 1, 2, 5, 10, 114, 117, and 146, and the east-west Routes 37 and 44. All of these roadways support a variety of industrial and commercial land uses.

With the exception of Johnston, communities in the substate area have an extensive rail system with freight service provided by the Providence and Worcester Railroad. Warwick is home to T. F. Green Airport, Rhode Island's primary facility for commercial air carriers.

Water: Full utility services are available in East Providence, Providence, and North Providence; portions of Cranston, Johnston, and Warwick lack public water, sewers, or both. Public water is generally available in all areas east of I-295 and has been extended to selected areas west of the route in Johnston and Cranston. The source of most of the public water in Substate Growth Area 3 is the Scituate Reservoir. The Kent County Water Authority provides service to portions of Warwick; East Providence maintains its own system, while the Providence Water Supply Board, the owners of the Scituate Reservoir, serves the balance of the area — either directly or through the water departments of Cranston and Johnston.

Sewers: Sewer service is generally available in the eastern portion of the substate area. The Narragansett Bay Commission provides wastewater treatment for East Providence, Providence, and North Providence, and the more densely populated sections of Johnston. Cranston maintains sewer service for the eastern half of the city. Warwick is only partially sewered, with the largest part of the service area encompassing the Post Road corridor. ((8))

04-05-03-04: Site Analysis

The significance of Substate Growth Area 3 on Rhode Island's economy is reflected in the amount of land set aside for industrial use as well as the E/P ratio. Industrial-zoned land totals 9,159 acres, ranking this area first among the substate growth areas. It represents 28 percent of the state's industrial land, and nearly 40 percent of the state's industrial land in industrial use — in an area accounting for only 12 percent for the state's total land area. Some 2,407 acres are vacant, of which 242 acres are considered of high potential with the remainder having mostly environmental problems (flood hazards or physiographic constraints) rather than infrastructure shortcomings. Refer to Table 212-04(8) for a summary.

Cranston: The City of Cranston has 14 sites designated industrial, taking in 1,674 acres. Approximately half of the acreage has been put to industrial use; 541 acres are currently vacant, and most of these are in floodplains.

The largest industrial site in Cranston includes the Pettaconsett Industrial Park and the Howard Industrial Park, measuring 494 acres in total and located at the intersection of R.I. Route 37 and Pontiac Avenue. About 240 acres are in industrial use, 124 in non-industrial use, and 130 vacant. All public utilities are available, and highway access is excellent. Most of the vacant land on the northern part of the site, above Route 37, is swampy and in the floodplain of the Pawtuxet River, presenting constraints to development.

Another large share of Cranston's industrial land is in the Western Cranston Industrial Park, where 239 acres of vacant land remain. This might be considered a

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TABLE 212-04(8):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 3

City or Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Cranston	1,674	849	285	541	80
East Providence	1,828	1,075	211	542	65
Johnston	723	195	193	335	0
No. Providence	81	30	34	17	2
Providence	2,426	1,483	628	315	18
Warwick	2,427	783	987	657	77
Total	**9,159**	**4,415**	**2,338**	**2,407**	**242**
State total	32,455	11,116	6,113	15,224	1,485
% state total	28.22	39.72	38.25	15.81	16.29

[1] All values are in acres, with the exception of "% state total." Use totals may differ from total acres due to rounding of fractional acreage to nearest whole number.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

prime site because of its good highway access, availability of public water, and location near the built-up metropolitan area. However, the soils present moderate limitations to development, being rocky in the eastern portion of the site, having a seasonal high water table in the central and western portions, and having a wetland in the northwestern corner. The Western Cranston Industrial Park is located southwest of the intersection of Plainfield Street (R.I. Route 14) and I-295.

There are three industrial sites in the city with vacant acreage that does not present environmental concerns in terms of flood hazards or unreasonable physiographic constraints. One of these sites includes the Narragansett Brewery property, which is slated for mixed-use development. ((11:4.25)) This site, measuring 136 acres in total, fronts on a rail line within an urban area and contains a mixture of industrial and other uses. Prior to the demolition of the brewery buildings, there were nine acres of vacant land there. The R.I. General Assembly designated the brewery site Rhode Island's tenth enterprise zone in 1998.

The second of these three sites is located southeast of the intersection of Narragansett Boulevard and Montgomery Avenue and features two vacant acres that may best be suited for the expansion of existing uses. Accordingly, this site is included among those of moderate development potential.

The third site offers 71 vacant acres, located just west of the Western Cranston Industrial Park. It is considered of high development potential. ((8))

East Providence: The City of East Providence has 1,828 acres of industrial land on 14 sites. All sites have public water and sewer, and 12 have natural gas service. Seven sites have rail service as well. Five sites are fully occupied; vacant land at the remaining nine sites varies in size from a single acre to 25 acres. Four of these sites have flood hazard potential, and three of the four also have physiographic constraints.

Among the sites with suitable physical conditions for development is the area at the intersection of R.I. Route 114 and New Road, a 52-acre site with 17 vacant acres. The configuration of this parcel may, however, inhibit development. On the other hand, a proposed Industrial Highway through the area may improve the site's development potential.

Another site along New Road, at the intersection with R.I. Route 1A, is the Narragansett Industrial Park. Properties there are almost totally developed, but 20 vacant acres remain. There are wetlands on-site, but on the property fringes so that wetlands restrictions should not inhibit development. The site also has rail access.

A site located in the Omega Pond area has some limited development potential. The site contains 18 acres of vacant land, but most of this is within a narrow strip between a rail line and the Seekonk River. It lies within a flood hazard zone. However, there are some large underutilized facilities on-site that are available for reuse.

The former Gulf Oil (now Cumberland Farms) site on the Veterans Memorial Parkway across from Lyon Avenue is available for reuse and new development, taking in some 20 vacant acres and considered of high potential. East Providence's

Waterfront Plan calls for a mixed-use development in this area, but the site is still zoned Industrial. The site has rail access, and a proposed Providence and Worcester quay facility will create 44 additional acres of waterfront land for intermodal port development. A new Port Development Waterfront Zoning District has been proposed to include the site and is being studied by the City Council.

Another high-potential site is located south of the intersection of Routes 114 and 6, but without rail access. The site can accommodate both new development and reuse. It includes the former Hemingway Trucking Terminal, which has been demolished and redivided into seven lots for industrial development with a new street, and an area along Amaral Street and the Old Wampanoag Trail being made available for industrial reuse. The site is 159 acres in total, 25 of which are vacant.

The largest industrial site by far in East Providence is located at the intersection of Routes 103 and 114, measuring 749 acres. The site is about 50 percent occupied, principally by oil terminal and storage facilities. The site's vacant land has varying capabilities for development, with constraints including rocky or poorly drained soils and flood hazards, and amenities including rail access and natural gas service. The site takes in an abandoned sand and gravel pit surrounded by steep slopes that would require extensive site preparation before development. The Mobil Terminal is also part of the site, and is designated for port development in the city's Waterfront Plan. Considerable vacant land exists on the Mobil site for industrial development, which would be subject to subdivision requirements for the extension of utilities and streets. ((8))

Johnston: The Town of Johnston has 19 industrial sites totaling 723 acres. Five of the sites are recommended for rezoning to bring existing non-industrial uses into conformance; three others are fully occupied. Eleven have full utilities and include natural gas service. Nine of the eleven have vacant acreage, but have flood hazard or physiographic constraints. The remainder lack utilities – either sewers, or sewers and water. Therefore, none of the sites in Johnston meet our criteria for high potential sites.

That does not mean that the town is essentially closed to further industrial development, but options are limited by the requirement for extensive site preparation, parcels of odd and perhaps unmarketable sizes, and residential development on-site. Six sites are within one mile of the Central Landfill. ((8))

The R.I. Resource Recovery Corporation, which owns and operates the landfill, plans to develop an industrial park that will measure approximately 310 acres, 240 to 250 of which will be developable. The park would combine land to the north of Shun Pike, west of its intersection with Scituate Avenue, and some 140 acres to the south that includes an area that is currently zoned residential. Though most of the residences have been removed, the town has not yet acceded to changing the zoning and that has delayed development of the park. ((83)) The portion of the park that has not been rezoned does not show up on our industrial site inventory.

North Providence: The Town of North Providence has nine industrial sites totaling 81 acres. All are fully serviced, and all but two have natural gas service

available. A former tenth site, measuring two acres, has been converted to commercial use.

Four of the town's industrial sites are fully occupied. A fifth site, measuring a single acre, is partially unoccupied but because of its small size is considered full. Of the four other sites, one is recommended for rezoning, and three have vacant acreage. Only one of the latter has no natural barriers to development (i.e., flood hazards or physiographic constraints), offering two vacant acres.

Other North Providence sites are limited by the presence of wetlands and the floodplain of the Woonasquatucket River, or by steep slopes and ledge. ((8))

Providence: The City of Providence accounts for 27 industrial sites and 2,426 industrial acres. All have full utility service, including natural gas. Acres in industrial use total 1,483, and vacant acres total 317 (spread over 11 sites). Eight sites have flood hazards, and most of those have soil or slope problems as well. Fifteen sites are fully occupied. Another site, which includes the Silver Spring Industrial Park at the intersection of Silver Spring and Charles Streets, has parcels recommended for rezoning due to surrounding and encroaching non-industrial uses.

There are four sites with vacant acreage and no apparent problems with flood hazards or physiographic constraints. These four sites also boast rail access. They include the area south of Olneyville Square, along Route 10 between Westminster and Union Streets, with 10 vacant acres; the Huntington Avenue Industrial Park along Niantic Avenue, with 39 vacant acres; and two sites at the intersection of Adelaide and Elmwood Avenues, with six and two acres respectively. The Huntington Avenue Industrial Park acreage lacks access and is suitable only for the expansion of existing uses, however, being more properly classified among the 15 fully occupied sites. It is not considered among Providence's highest potential industrial sites.

Another site with limited development possibilities is located in the Davol Square/Rhode Island Hospital/Port of Providence area. Although most of the vacant parcels at the site and small and irregular in shape, there is one sizable parcel with waterfront access and good access to I-95. Most of this parcel lies within a flood hazard area, however; development there is expected to be limited to an industry that requires a waterfront location. Altogether, there are 85 vacant acres at this site.

The 1990 *Industrial Land Use Plan* made the following observation:

> [G]iven the historical pattern of locating industry astride waterways, much of the city's vacant acreage is found in flood hazard areas. Aside from the Port of Providence, the city would find it difficult to assemble a tract of developable vacant industrial land of any significant size. Nevertheless, what the city lacks in developable sites it more than makes up for with 1,748,068 sq. ft. of vacant industrial space. This in fact may be the capital city's most valuable industrial development resource. ((11:4.27))

Aside from the exact square footage of vacant space, this assessment remains accurate. As in the other older industrial cities in Rhode Island, underutilized

buildings carry great potential in Providence for redevelopment and need to be the focus of future economic development efforts. ((8))

Warwick: The City of Warwick has 2,427 industrial-zoned acres spread over 16 sites, ranging in size individually from seven to over 1,000 acres. Total acreage in non-industrial use is high in Warwick because of nearly 840 acres in the site encompassing T. F. Green Airport in Hillsgrove being devoted to other uses. Fifteen of the 16 sites have public water; ten of the fifteen also have sewers. All but one site (which also lacks water and sewers) have natural gas service.

Floodplains, wetlands, and poor soils constrict industrial development on most of the city's vacant industrial land. There are only two sites, offering four and 77 vacant acres respectively, with no environmental constraints. The first is located at the junction of Routes 1 and 1A. This site, measuring 10 acres in total, has small parcels of vacant land in irregular configurations. The second is located on Pavilion Avenue, across from Green Airport, and with access from Commerce Drive. It measures 87 acres in total. The vacant land is currently zoned light industrial. Highway access is excellent, the site being within minutes of Route 37 and I-95.

While these two sites represent the only industrial sites in Warwick completely free of environmental constraints, there are other sites that are large enough to accommodate development at a reasonable distance away from problem physical features. The T. F. Green Airport site, for example, shows such development potential. The site contains 1,040 acres in total, 119 of which are vacant. A wetland and a former landfill, neither of which is conducive to development, occupies the largest vacant parcel. However, the western half of this parcel — adjacent to existing industries — does appear to be far enough removed from these constraints to be able to support development.

Similarly, at a site north of intersection of Route 37 and I-95, one finds a mixture of vacant parcels, the larger of which are partially within flood-prone wetlands areas and appear to lack easy access. Portions of these parcels could be developed, however, if the wetlands are avoided and the access problems can be resolved.

A third site, located southeast of the intersection of Airport and Post Roads, has small vacant parcels in its southern portion that appear suitable for small-scale industrial and commercial development similar to what currently exists on the site. The northern portion, on the other hand, is not so suitable, being characterized by sloping land and wetlands.

A fourth site is located along Jefferson Boulevard, containing two sizable vacant parcels but also flood hazard or wetland problems. Use of the northernmost is constricted by these natural features and by its irregular shape, but small-scale industrial development might be accommodated if sited carefully. The greatest potential for development is along the southern portion of the site — the location of Metro Park, which is currently being developed for light industry and office use.

None of the acreage in these last four sites is included in our tally of "high potential" vacant acreage. Our level of coverage is not fine enough to permit the parcel-by-parcel assessment required to include them. ((8))

This assessment of industrial land in Warwick has not included plans for a "Warwick Station Redevelopment District" that would take advantage of intermodal transportation opportunities in the immediate area of T. F. Green Airport. This would include a 22.4-acre Intermodal Zone, where the zoning designation would be changed from light industrial to general business. Within this zone would be a new railroad station, the airport terminal, properties accommodating retail, commercial, and office uses, and what has been described as a "circulation access spine" linking the airport and train. The zoning change would be necessary to accommodate the hotels and restaurants deemed appropriate for an Intermodal Zone, and to prohibit currently permissible industrial uses that would clearly be incompatible (e.g., bottling and paper plants, dry cleaning plants, fish packaging plants, and open lot storage). ((88))

04-05-03-05: Conclusions

Our analysis of vacant industrial land is summarized in Table 212-04(9) and yielded what appears at first glance to be a rather conservative estimate of high-potential acreage (242 acres). This was due to our tendency to discount totally those sites with floodplain or soil and topographic concerns. There may in fact be additional acreage available for light industry that could be located far enough away from physical features that would normally preclude industrial development. Unfortunately, many of these parcels are further constrained by a lack of access — even though they may be only short distances from state or interstate highways — and a tendency to be small and fragmented.

What is perhaps more important than the availability of vacant land is the opportunity in Substate Growth Area 3 to rehabilitate and reuse underutilized buildings that, like Substate Growth Area 1, are this area's industrial legacy.

Providence has led the creative reuse of some of these buildings for an array of industrial, commercial, and residential purposes. This trend is expected to continue as communities in the area participate in the mill building reuse program. If a reasonable number of these buildings can be kept in

TABLE 212-04(9):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 3

City or town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Cranston	14	541	541	541	222	82
East Providence	14	542	542	542	448	83
Johnston	19	335	268	199	0	0
No. Providence	9	17	17	17	0	2
Providence	27	315	315	315	262	18
Warwick	16	657	657	638	393	81
Total	**99**	**2,407**	**2,340**	**2,252**	**1,325**	**266**

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

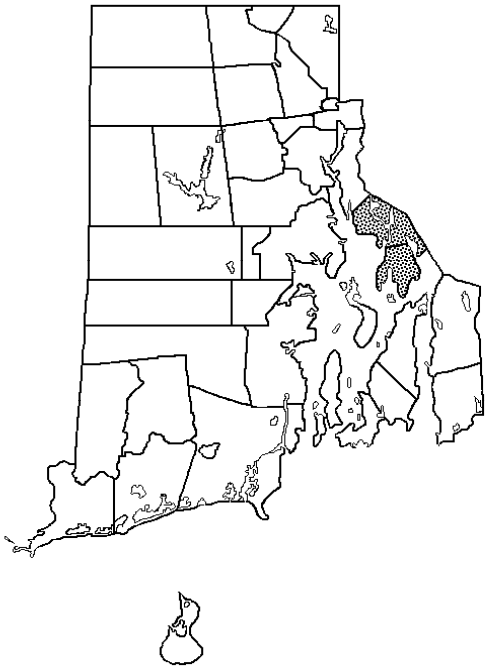
industrial use, they can help make up whatever shortcomings exist in the availability of open, accessible parcels of industrial land. They may emerge as ideal candidates for locating the rising industrial sectors — services and wholesale and retail trade.

One last note on Substate Growth Area 3, which can apply to other parts of the state as well: the decline in manufacturing forecasted by our employment projections and the gain in trade and service industry jobs suggests the need for, or at least the attractiveness of, mixed-use zoning in the available industrial acreage.

Industrial development potential in Substate Growth Area 3 is presented graphically on Map 212-04(3).

MAP 212-04(3):
SUBSTATE EMPLOYMENT GROWTH AREA 3

04-05-04: Substate Employment Growth Area 4



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	45,600	16,196	8,715	0.19
1980	46,942	"	9,265	0.20
1985	47,400	"	10,725	0.23
1990	48,859	"	9,555	0.20
1995	48,511	"	10,380	0.21
2000	48,986	"	10,814	0.22
2005	49,157	"	11,176	0.23
2010	49,230	"	11,538	0.23
2015	49,342	"	11,900	0.24
2020	49,621	"	12,262	0.25

04-05-04-01: Demographic Profile

Three towns comprise Substate Employment Growth Area 4: Barrington, Bristol, and Warren (Bristol County, R.I., in its entirety). It is the smallest of the Substate Growth Areas at 16,196 acres. With a 1995 population of 48,511, the area's population density, 3.00 persons per acre, is about twice the state average. Population growth, however, is projected to lag behind most of the other Substate Growth Areas from 1995 to 2020. Employment growth will also be significantly less than the state average during this period, according to the regression analysis performed by Statewide Planning Program staff.

04-05-04-02: Economy

The largest private employment sectors in Substate Growth Area 4 are services, manufacturing, and wholesale and retail trade. In the manufacturing sector, ship and boat building and repairing (SIC 373), miscellaneous manufacturing (SIC 39), and industrial and commercial machinery and computer equipment (SIC 35) are the largest employers areawide. In Bristol, textile mill products (SIC 22) and rubber and plastics products (SIC 30) are sector leaders. Manufacturing employment has fallen by one-third due primarily to decreases in boat building and textiles from 1985 to 1995.

Service employment has grown sufficiently to supplant manufacturing as the leading industrial sector, gaining 834 jobs from 1985 to 1995. The biggest share of service employment is in educational services (SIC 82), primarily in Bristol (home of Roger Williams University); this is followed by health services (SIC 80), represented well in all three communities, and social services (SIC 83).

Durable goods (SIC 50) rank first areawide in wholesale trade employment, but nondurable goods (SIC 51) are predominant in Bristol. Eating and drinking places (SIC 58), food stores (SIC 54), and miscellaneous retail (SIC 59) account for the most jobs in retail trade. The wholesale-retail sector is growing significantly in Bristol, but less so in the other towns. ((63))

Statewide Planning's forecast of employment trends in Substate Growth Area 4 suggests that while manufacturing led wholesale/retail and services in employment in 1990, it will be in third place by 2000 and continuing to decline through 2020. Services, meanwhile, will grow faster than wholesale/retail, adding nearly 3,300 jobs — an increase of 116 percent. Wholesale/retail will grow by 1,801 jobs, or about 93 percent. We expect about nine percent of these jobs will be in wholesale trade. ((64))

These trends are summarized below.

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	3,454	2,434	1,273	112	-3,342
Wholesale/retail	1,933	2,783	3,258	3,734	+1,801
Services	2,830	3,903	5,014	6,125	+3,295

The numbers suggest a dramatic fall in manufacturing employment in Substate Growth Area 4 over the period 1990 to 2020, and imply that at some point beyond the year 2020 manufacturing employment will "zero out," being replaced virtually job-for-job by services. As in Substate Growth Area 3, there is a danger in jumping to such a hasty conclusion about employment in certain industrial sectors. This is explained in detail in the Methodology on page 4.4. By the time we reach 2020, the downward trend in manufacturing employment in this substate area may have proven itself not nearly as radical as our regression analysis portends; it may even have reversed.

04-05-04-03: Infrastructure

The principal geographic feature of Substate Growth Area 4 is its extensive coastline, bordering Upper Narragansett Bay and Mt. Hope Bay. The area's ports are limited to serving small-scale fishing operations and recreational boating.

Transportation: Bristol County lacks immediate access to interstate highways, with I-195 providing the closest major route to southeastern Massachusetts and the Providence metropolitan area. Rhode Island Routes 114 and 136 are the area's major north-south corridors. Both routes support long stretches of residential, commercial, and some limited industrial development. The area is no longer serviced by freight or passenger rail service, nor is it within close proximity to a state airport.

Utilities: The utility infrastructure is well developed, although current capacity is somewhat limited. Public water for the tri-town area is provided by the quasi-public Bristol County Water Authority. Presently, water service is available at all industrial sites in Substate Growth Area 4. Most sites are sewered, with the exception of three sites in Warren. Natural gas service is available at all the area's industrial sites. ((8))

04-05-04-04: Site Analysis

Our community survey rendered a total of 499 industrial-zoned acres in Substate Growth Area 4, making it one of the smallest aggregations of industrial land in the state. This total represents a decrease of 58 acres from the inventory cited in the 1990 *Industrial Land Use Plan*. One hundred thirty-eight acres, or 28 percent of the total, are vacant; of these, only 16 acres are considered of high potential. Flood hazard areas concentrated in Warren represent the major environmental constraint. A town-by-town account is given in Table 212-04(10).

Barrington: The Town of Barrington has four industrial sites, only one of which is fully occupied. The sites are of very modest size: three of them each measure five acres, and the fourth, eight acres. All of the sites have the full suite of utilities, including natural gas service, and no floodplain, soil, or topography problems. There is, however, no rail access at any of the sites.

The fully-occupied site is located northeast of the intersection of Bay Spring Avenue and Narragansett Avenue. At the site is the closed Rhode Island Lace Works Mill (a 300,000 sq. ft. brick building), presently under consideration for conversion to an elderly nursing complex. The project may involve removal of the mill. Regardless of whether the mill building is rehabbed and reused or demolished, future use of the site will likely be a mix of residences and health services typical of an assisted-care facility.

TABLE 212-04(10):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 4

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Barrington	23	5	1	17	0
Bristol	267	200	22	45	4
Warren	209	89	44	76	12
Total	**499**	**294**	**67**	**138**	**16**
State total	32,455	11,116	6,113	15,224	1,485
% state total	1.54	2.64	1.10	0.91	1.08

[1] All values are in acres, with the exception of "% state total." Use totals may differ from total acres due to rounding of fractional acreage to nearest whole number.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

A second five-acre site has been recently subdivided from a larger parcel containing the former Pilling Chain Mill, which is now under conversion to a 60-apartment elderly housing complex. This site is west of the mill pond (which separates it from the mill site) and Allins Cove; it has frontage on Adams Avenue, which places it within five miles of both a state highway and an interstate highway. Industrial use may be limited by its proximity to the apartments.

The third five-acre site is located north of Bay Spring Avenue, with frontage on that street and adjoining the East Bay Bike Path. The rear of the parcel is separated from frontage by a 1.24-acre pond, giving it something less than three acres of developable land and limiting its potential.

The fourth site, also north of Bay Spring Avenue, was under consideration at one time (in 1980) for a congregate care facility with 200 elderly apartments. There have been no development proposals since then. The site is owned by a tax-exempt private organization and measures slightly more than eight acres. ((8))

Bristol: There are three industrial sites in the Town of Bristol with vacant acreage. The first, measuring 195 acres in total with 41 vacant acres, is the site of the East Bay Industrial Park. This site includes a small golf course and other uses.

Soil conditions are favorable in most areas of the park except for the southeastern part, where the water table is high.

The second site, located on Rhode Island Route 136 south of Hopeworth Avenue, contains only two vacant acres out of a total of 44 acres. However, 13 of the 42 occupied acres are in fact occupied by vacant industrial buildings that may have some potential for reuse.

The third site occupies slightly less than four acres, 1.5 acres being totally occupied by an automotive dealership. The remaining vacant land has potential for development.

The second and third sites contain no apparent soil, topographic, or flood hazard concerns. All industrial sites in Bristol are within one mile of a state highway, but none have rail access. ((8))

Warren: The Town of Warren has 76 vacant acres scattered among five of its eight industrial sites. These sites range in size from three to 68 acres. Two of the sites with vacant acreage lack sewers, and all lack rail access.

Seventeen acres of vacant industrial land are found at a site on Main Street, below the Warren River. Development potential there is hampered by flood hazards. Similarly, a site with 34 vacant acres on Route 136, north of School House Road, contains both wetlands and flood hazards. Since that site lacks sewers and possesses a high water table, the disposal of wastewater could be a problem; however, northern portions of the site (adjacent to Route 136) could be developed for small industries if acceptable methods for handling the wastewater could be devised.

Twelve acres of vacant land at a third site, located at the intersection of Route 114 and 103, are divided between two parcels that appear to lack access and thus have limited potential for development. The larger parcel also lies within a flood hazard area.

There are two other sites in Warren with fully-serviced vacant land and no environmental constraints. One is located on Route 136, south of the intersection with Route 103, but is likely to be suitable only for expanding existing industrial use. The other contains a sizeable amount of undeveloped land (12 acres) of high development potential. It is also located on Route 136, in the vicinity of School House Road. ((8))

04-05-04-05: Conclusions

While there is fully-serviced industrial acreage in Substate Growth Area 4 that is presently vacant, development is constrained by soil and topographic concerns or flood hazards, the lack of rail access and service, and distance to interstate highways. This is shown in Table 212-04(11).

Some of the area's best potential for industrial development is in the reutilization of existing buildings. Two relatively large facilities, the former Kaiser plant and the American Tourister plant, are being targeted for the mill building reuse program in Bristol and Warren, respectively. Either complex could house a major employer, several smaller businesses, or business incubators.

Map 212-04(4), on the second page following, assesses industrial development potential in Substate Growth Area 4.

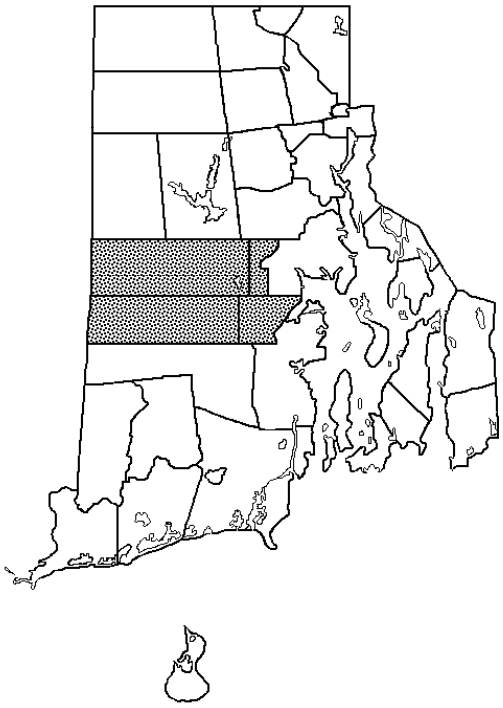
TABLE 212-04(11):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 4

Town		*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Barrington		4	17	17	17	0	17
Bristol	6	45	45	45	0	4	
Warren		8	76	76	42	0	12
Total		**18**	**138**	**138**	**104**	**0**	**33**

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

MAP 212-04(4):
SUBSTATE EMPLOYMENT GROWTH AREA 4

04-05-05: Substate Employment Growth Area 5



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	62,800	85,822	11,335	0.18
1980	67,040	"	14,632	0.22
1985	70,800	"	15,476	0.22
1990	75,708	"	15,311	0.20
1995	75,170	"	18,849	0.25
2000	77,896	"	19,833	0.25
2005	80,223	"	21,403	0.27
2010	82,430	"	22,974	0.28
2015	84,831	"	24,545	0.29
2020	87,577	"	26,116	0.30

04-05-05-01: Demographic Profile

Substate Employment Growth Area 5 takes in Kent County, with the exception of the City of Warwick. Represented there are Coventry, East Greenwich, West Greenwich, and West Warwick. The area's 85,822 acres make it comparable in size to the state's average substate area, while its population density, 0.88 persons per acre (1995), is substantially less than the state's average.

Low population density reflects the suburban and rural character of Substate Growth Area 5. However, population growth in the area is among the fastest in the

state. Employment growth surpassed the state average strikingly from 1985 to 1995. Regression analyses based on those numbers suggest significant increases in population and employment through 2020.

04-05-05-02: Economy

Substate Growth Area 5 is unique among the substate areas in that manufacturing is expected to grow rather than shrink there as a sector *and* to lead the second- and third-place sectors, wholesale/retail and services, through 2020.

Industrial and commercial machinery and computer equipment (SIC 35) lead in manufacturing jobs areawide because of heavy representation in a single community, East Greenwich. Chemicals and allied products (SIC 28) are second overall, but first in Coventry and West Warwick. Electronic and other electrical equipment and components, except computers (SIC 36) are third, with employment concentrated in East Greenwich and West Warwick. Fabricated metal products (SIC 34) are fourth, but second in West Warwick. ((63))

Nondurable goods (SIC 51) led wholesale employment trade years ago in most of Substate Growth Area 5, but then faltered in the most recent recession and began running second to durable goods (SIC 50). Durable goods continue to lead. In retail, eating and drinking places (SIC 58) are first overall in employment, followed by food stores (SIC 54) and miscellaneous retail stores (SIC 59). Automotive dealers and service stations (SIC 55) are first in retail employment in West Greenwich, third in West Warwick, and fourth overall. ((63))

As in other substate areas, we found health services (SIC 80) leading all other service industries in employment in Substate Growth Area 5. Health services are followed by business services (SIC 73), personal services (SIC 72), and social services (SIC 83). In West Warwick, business services do not make as large a contribution to employment as personal services, social services, and auto repair services (SIC 75). Growth in health service employment is steady, while business services have begun growing again after a slump. ((63))

Our forecast of employment trends in Substate Growth Area 5 through 2020 is summarized below. Regression analyses indicated steady growth in all three sectors into the 21st Century, with manufacturing gaining 1,474 jobs, wholesale/ retail 2,115 jobs, and services 3,409 jobs. In wholesale/retail, about 13 percent of the employment is in wholesale trade. ((64))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	6,581	7,398	7,726	8,055	+1,474
Wholesale/retail	4,926	5,475	6,258	7,041	+2,115
Services	2,886	3,991	5,143	6,295	+3,409

04-05-05-03: Infrastructure

The communities comprising Substate Growth Area 5 are a study in contrasts, ranging from urbanized West Warwick (with a population density almost four times the state average) to rural West Greenwich (with the lowest population density in the state, one-tenth of a person per acre). The area includes Rhode Island's most affluent municipality, East Greenwich, and the one that is the largest in terms of acreage, Coventry. The geography varies from crowded coastal inlets in the east to large tracts of rural, undeveloped land to the western Connecticut border. ((11))

Transportation: As would be expected, the eastern portion of Substate Growth Area 5 has an extensive transportation infrastructure, with I-95 and R.I. Route 4 serving as the major north-south routes. Interstate 95 also swings more westerly in the southern part of the growth area, providing access to the southeastern corner of Coventry and bisecting West Greenwich. The area's other major roadways include R.I. Routes 3, 102, and 117. ((11))

Rail service is available through the Shore Line through East Greenwich; the Washington Secondary Track serving West Warwick and Coventry is no longer available. The freight-dedicated "Third Track" will run through East Greenwich when it is completed.

Water: Utility infrastructure is most fully developed in the eastern part of Substate Growth Area 5. The Kent County Water Authority provides water to virtually all of West Warwick, the eastern portion of Coventry, central and eastern East Greenwich, and the Mishnock Pond area of West Greenwich. Most of the area's public water supply is drawn from the Scituate Reservoir. ((11))

Sewers: Sewer service is somewhat less developed. West Warwick is almost totally sewered, and the town also provides treatment to portions of Coventry and West Greenwich. Sewers have been extended along Hopkins Hill Road and New London Turnpike in Coventry to serve two adjoining industrial parks in West Greenwich. East Greenwich has extended sewer service along the R.I. Route 2 corridor from Division Street to Middle Road, and plans to extend service to areas south of Middle Road. ((81))

04-05-05-04: Site Analysis

There are 3,091 acres zoned industrial in Substate Growth Area 5. Vacant industrial acreage was nearly halved in the period from 1988 to 1997. Of the 1,356 acres currently vacant, only 45 acres are considered "high potential," the others being limited by environmental concerns or infrastructure limitations. ((8)) Table 212-04(12) gives the full account of industrial land by town.

Coventry: Coventry has six sites set aside for industry, totaling 1,157 acres. All have public water, but sewer service (via the Town of West Warwick) is limited. Five of the six sites have natural gas service. One of these measures a modest four

TABLE 212-04(12):

SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 5

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Coventry	1,157	305	289	563	0
East Greenwich	408	182	119	107	0
West Greenwich	883	405	50	428	45
West Warwick	643	180	205	258	0
Total	**3,091**	**1,072**	**663**	**1,356**	**45**
State total	32,455	11,116	6,113	15,224	1,485
% state total	9.52	9.64	10.85	8.91	3.03

[1] All values are in acres, with the exception of "% state total." Use totals may differ from total acres due to rounding of fractional acreage to nearest whole number.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

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acres and is fully occupied. The site lacking gas service is of identical size and fully occupied also, but with non-industrial uses. Other sites have either flood hazard or soil and topographic concerns.

The largest of the town's industrial sites, measuring some 534 acres, is located at and around the Coventry Airport between Routes 3 and 103. This site is already more than one-half developed, with the airfield, a gravel pit, some industry, and other uses. The site also has rail access. Much of the remaining vacant land, however, is limited by the presence of wetlands and soils with a seasonal high water table, or is in the floodplains of the Pawtuxet and Mishnock Rivers. Another problem is that the arrangement of existing uses throughout the site has restricted access to some land. The final constraint is that the site is within the Mishnock groundwater aquifer.

The second largest site, some 449 acres in total with 268 acres of vacant land, is located between Hopkins Hill Road and Arnold Road. Sewer service is being extended to the site, which, coupled with its excellent highway access, should improve development potential. However, further development would have to overcome topography limitations — slopes, high water tables, and streams. Some of the land adjoins residential areas, which poses access and compatability problems. This site also is within the Mishnock aquifer.

The remaining sites measure 65 acres and 101 acres, respectively. The first is located on Howard Street, the second south of the intersection of Route 117 and Fairview Avenue. At each, vacant land is in the form of fragmented parcels within river floodplains or wet areas, and therefore is of limited development potential. ((8))

East Greenwich: Our inventory for the Town of East Greenwich shows 408 industrial acres, scattered among 12 sites ranging in size from one acre to 136 acres. All but two have natural gas service, and both of these are fully occupied. Five sites have vacant land. Four are limited by access, flood hazard, and/or soil and

topographic concerns. One of the four, north of the intersection of Route 2 and Frenchtown Road, is located within the Hunt River Aquifer. The fifth site, on Route 2 south of Division Street, has poor access and verges on wetlands. ((81))

One of the sites with environmental and infrastructure constraints does have portions with some potential for development, provided flood hazard areas or hydric soils are avoided. This site is located southeast of the intersection of Route 2 and Middle Road and has some development already. Highway access, public water and sewer service are available. ((8)), ((81)), ((101))

East Greenwich's future land use map, approved by the state in 1998, greatly expands the land available for industrial development. Municipal sewers have been installed in formerly unsewered areas between Division Street and Middle Road along the Route 2 corridor. The town's policy is to pursue light industry and office/office park types of development along Route 2, rezoning properties if need be in response to specific proposals. Revisions in industrial zoning may more than double the available acreage over what is reported here. ((101)) The new industrial sites, lying adjacent to existing sites, would bring total industrial land, occupied and vacant, to over 1,100 acres.

West Greenwich: Industrial land in industrial use in the Town of West Greenwich has more than doubled since 1988. The town has ten industrial sites, totaling 883 acres. Six sites have vacant land. Within these six, there are 428 vacant acres, some 45 of which — at one site, the West Greenwich Technology Park — appear to be of high potential.

The West Greenwich Technology Park is located northeast of the intersection of I-95 and Hopkins Hill Road at the former "Digital site." It is being developed as part of a regional industrial park that includes abutting acreage in Coventry and West Warwick. The site now boasts public water and sewers, the infrastructure having been extended to accommodate two large industrial clients. Vacant acreage may require some site preparation (as it is a former gravel pit) but soils pose no apparent constraint to development. The site's frontage on an interstate highway offers excellent transportation access.

A site with some potential for specialized operations is located southeast of the intersection of Hopkins Hill Road and Bates Trail. The site measures 205 acres and is presently undeveloped. It lacks public water and sewers. In addition, stony soils and moderately steep slopes in some areas may impose limitations on septic systems and other forms of subsurface construction. The site has good highway access, however, making it suitable perhaps for distribution activities or other low-intensity development. ((8)), ((86))

West Warwick: West Warwick's industrial site inventory has not changed in terms of total acreage since the last *Industrial Land Use Plan,* but some land has shifted use. Out of a total of 643 acres at nine sites, 180 are in industrial use, 339 in non-industrial use, and 258 left vacant. Eight sites have vacant acreage, ranging in size from one acre to 152 acres (at the regional industrial park abutting the West Greenwich Technology Park). All eight sites have the full suite of utilities, including natural gas service; four have rail access as well.

Much of West Warwick's industrial land is scattered along the north and south branches of the Pawtuxet River. ((11)) These sites typically contain older textile mill complexes and are located along town streets that pose access problems. Proximity to the river also suggests flood hazards, while wetlands also constrain development on many of the vacant parcels. Vacant areas within four of the sites are appropriate mainly for the expansion of existing uses. ((8))

There is but one site with no environmental constraints among the sites with vacant acreage. It is located northwest of the intersection of Legris Avenue and Church Street. Vacant land at the site measures a single acre, and so is most likely only appropriate for expanding existing uses.

There are other sites that appear to have sizable parcels within them that can support development, although other parcels have unfavorable topography, wetlands, high water tables, or floodplains. One is located north of the intersection of Providence Street and Main Street and has 54 acres of vacant land. The presence of steep slopes and a former landfill constrain development, but a parcel in the eastern portion of the site, adjoining a rail line, could be used if road and highway access are available.

Wetlands and flood hazard conditions diminish the development potential of the site adjoining the West Greenwich Technology Park. Developers will have to address wetland and flood hazard conditions in about half of the parcel, north of I-95, and several smaller wetland areas to the south. Most of the remainder of the site may be conducive to industrial development, but the site as a whole cannot under our criteria be considered "high potential." ((8))

04-05-05-05: Conclusions

Table 212-04(13) portrays a paucity of developable acreage in Substate Growth Area 5 that is somewhat misleading if considered only under our gross, sitewide scale. There do exist sites of sufficient size to enable developers to "engineer around" localized environmental constraints, and the general availability of all utilities in the area is good.

Extension of sewer and water can promote industrial development ancillary to the West Greenwich Technology Park and elevate otherwise acceptable sites into sites of high potential. It should be noted that only one West Greenwich site was identified as having physiographic constraints (stony soil and moderately steep slopes).

The East Greenwich Planning Board has recommended that industrial uses be extended to the entire length of Route 2 on the westerly side, down to a local Ford

TABLE 212-04(13):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 5

Town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Coventry	6	563	563	0	261	0
East Greenwich	12	107	107	44	9	4
West Greenwich	10	428	54	45	0	45
West Warwick	9	258	258	258	78	1
Total	**37**	**1,356**	**982**	**347**	**348**	**50**

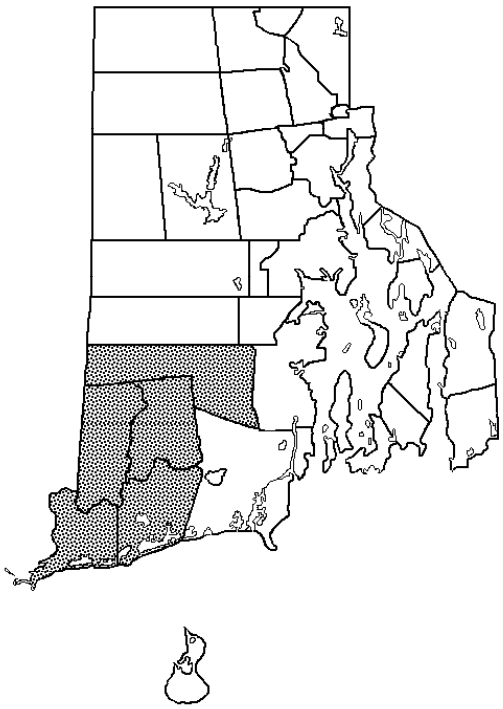
Source: Statewide Planning Program Industrial Land Inventory (1997-99)

dealership located at the northwest corner of Route 2 and Frenchtown Road. This proposal would provide a significant increase in prime industrial land – with sewer, water, excellent transportation access, and close proximity to the Quonset Davisville Port and Commerce Park.

Map 212-04(5) summarizes the industrial development potential of sites in Substate Growth Area 5.

MAP 212-04(5):
SUBSTATE EMPLOYMENT GROWTH AREA 5

04-05-06: Substate Employment Growth Area 6



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	34,100	130,635	6,017	0.18
1980	38,257	"	8,564	0.22
1985	41,100	"	9,390	0.23
1990	45,768	"	10,852	0.24
1995	45,444	"	11,819	0.26
2000	48,203	"	13,496	0.28
2005	50,557	"	14,885	0.29
2010	53,596	"	16,274	0.30
2015	56,584	"	17,664	0.31
2020	60,000	"	19,053	0.32

04-05-06-01: Demographic Profile

Substate Employment Growth Area 6 has five towns: Charlestown, Exeter, Hopkinton, Richmond, and Westerly. It is the largest of the eight substate areas, taking in 130,635 acres. The area's population in 1995 was 45,444, giving it a population density of 0.35 persons per acre and revealing its rural character. Population density is projected to increase to 0.46 persons per acre by 2020. ((67))

Employment growth from 1985 to 1995 was substantially greater than the state average; significant growth is expected to continue through 2020.

04-05-06-02: Economy

According to our regression analysis, wholesale and retail trade and services in Substate Growth Area 6 will follow the general trend in Rhode Island of growth through 2020. Manufacturing will gain, then lose a modest number of jobs in the same period. This follows an up-and-down pattern in manufacturing employment from 1975 to 1995, *vs.* steady growth in the other sectors.

Textile mill products (SIC 22) dominate manufacturing employment in Substate Growth Area 6, with their greatest strength in Westerly. Rubber and plastics products (SIC 30) are second areawide, followed by paper and allied products (SIC 26), primarily from Hopkinton. ((63)) A major contributor to employment in SIC 26, however, closed its facility in Hopkinton in June, 1998. ((71))

Nondurable goods (SIC 51) are first in wholesale trade employment in Westerly, but durable goods (SIC 50) lead elsewhere. Eating and drinking places (SIC 58) lead retail employment areawide, followed by food stores (SIC 54) and miscellaneous retail stores (SIC 59). Automotive dealers and service stations (SIC 55) are second in retail employment in Hopkinton, and fourth in most of the other towns. ((63))

Health services (SIC 80) have the biggest share of areawide services employment and are concentrated in Westerly. Social services (SIC 83) lead services employment in Charlestown, Exeter, and Hopkinton, and are in second place in Westerly. Amusement and recreational services (SIC 79) are third areawide, but second in Hopkinton. Growth in health services and social services from the mid-1980s has been dramatic in Westerly, but far more modest (essentially level) in the other communities. ((63))

Our forecast of employment trends in Substate Growth Area 6 through 2020 is summarized below. The fastest growing sector is services, but it will remain second in employment to wholesale/retail into the next century. Even though manufacturing will be steadily losing jobs from 2000 to 2020, the loss is not large enough to offset completely the gain from 1990 to 2000. About eight percent of the jobs under wholesale/retail will be in wholesale trade. ((64))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	1,742	2,107	2,062	2,017	+ 275
Wholesale/retail	3,939	4,605	5,599	6,594	+2,655
Services	2,943	4,122	5,213	6,304	+3,361

04-05-06-03: Infrastructure

Substate Growth Area 6 forms the southwest corner of Rhode Island, with two of its communities — Charlestown and Westerly — bordering Block Island Sound and a number of coastal ponds. The rest of the area is defined hydro-logically and geographically by the Wood and Pawcatuck Rivers and their subwatersheds.

Transportation: The northwest portion of Substate Growth Area 6 has good access to I-95, which provides the major north-south corridor to that area. Numerous state routes provide additional north-south access. Rhode Island Route 138 east of I-95 is one of two major east-west corridors. The second is Route 1, which connects points along the coast.

The area has passenger rail service with stops by Amtrak at the Westerly station. Limited air charter and freight service at Westerly State Airport, a primarily commuter-oriented facility.

Utilities: In keeping with the rural character of the area, the utility infrastructure is concentrated in the most urbanized areas of Westerly, and small, scattered neighborhoods elsewhere. In most communities, there is no public water, sewerage, or natural gas service on industrial land.

Public water is limited to parts of Westerly and the Canob Park/Wyoming section of Richmond. Sewers are available only in downtown Westerly and the surrounding area, and through a small system in the Village of Bradford that is tied into a local textile plant's treatment facility. A similar small, primary treatment system exists at the Ladd Center in Exeter, which is presently closed.

It is important to note that a substantial percentage of the land area of Substate Growth Area 6, including industrial land, falls within the Pawcatuck Sole Source Aquifer. ((11))

04-05-06-04: Site Analysis

While nearly 4,371 acres have been zoned industrial in Substate Growth Area 6, only 516 acres are in industrial use. Eight hundred nine acres are in other use, and 3,047 acres are vacant (undeveloped).

Comparisons with 1988 data used in the original *Industrial Land Use Plan* show that industrial use of industrial land in the Substate Growth Area has increased (516 acres in industrial use in 1997 *vs.* 377 in 1988), but the total acreage of industrial land has decreased and is presumed rezoned. The greatest losses of industrial land occurred in Exeter and Richmond; Charlestown and Hopkinton's industrial acreage and distribution of uses (industrial, other, and vacant) have remained the same. The Town of Westerly gained some industrial land, a modest 74 acres, over the same period.

In 1988, almost three-fourths of the total acreage zoned for industrial use was vacant; it was noted in the *Industrial Land Use Plan* that "due in large part to the area's dearth of infrastructure, virtually none of this acreage is considered prime for development." ((11:4.42)) In 1997, 70 percent of the area's industrial land remained

vacant. Only 32 acres, all of them in Westerly at a single site, have the "prime" characteristics of public water, sewers, and an absence of environmental constraints to development. ((8)) This is depicted in Table 212-04(14) below, and explained town-by-town in the narrative that follows.

Charlestown: The Town of Charlestown has three sites designated for industrial use, two of which are fully occupied. The remaining site is the former location of United Nuclear on Narragansett Trail, measuring 1,100 acres in total, of which nearly all are vacant. All but five acres are developable, those acres being excluded by a R.I. Department of Environmental Management monitoring agreement because of residual contamination. Soil conditions vary throughout this site, with generally rocky and stony, sloping soils in the northern and eastern portions. There are wetlands and endangered species habitat along the western border and in the southwestern corner of the site.

There are, however, major obstacles to the industrial development of the United Nuclear site. These include a lack of public utilities, location over a groundwater recharge area, the Wood River aquifer, and the relative remoteness of the site. Additionally, the site is now zoned "Planned Development," intended to accommodate residential, commercial, and light industrial uses commingled according to performance standards. While the site remains on our list, it should not be assumed that the considerable acreage available for development will be reserved for industrial use. ((74))

Exeter: The Town of Exeter has a single industrial site, about one-sixth of which is occupied by industrial and non-industrial uses. It is located at the intersection of Nooseneck Hill Road and Ten Rod Road. There are 236 vacant acres at the site, but further development is hampered primarily by a lack of utilities,

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TABLE 212-04(14):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 6

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Charlestown	1,100	0	5	1,095[2]	0
Exeter	282	14	32	236	0
Hopkinton	691	29	197	465	0
Richmond	627	239	49	339	0
Westerly	1,671	234	526	912	32
Total	**4,371**	**516**	**809**	**3,047**	**32**
State total	32,455	11,116	6,113	15,224	1,485
% state total	13.47	4.64	13.23	20.01	2.15

[1] All values are in acres, with the exception of "% state total." Use totals may be greater than total acres due to rounding of fractional acreage to nearest whole number.
[2] Vacant acres zoned "Planned Development"; not all are expected to be available for industrial use.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

stony soils and a seasonal high water table in specific areas, and slopes ranging from three to eight percent or more. The site does boast excellent access to state and interstate highways, however. ((8))

The 1990 *Industrial Land Use Plan* mentioned another site in Exeter that, although not zoned industrial, was being actively considered for economic development: the state-owned Ladd Center, a 330-acre site along R.I. Route 2 housing an intensive care facility for the mentally retarded that was to cease operations by 1991. (The actual year of closure was 1994.) Today, four years after its closure, Ladd Center is still unoccupied but attracting notice. In its favor are a complete utility and road infrastructure and its campus-like environment, although structures on site are likely to require substantial refurbishment and upgrade, including the wastewater treatment facility. Intensive redevelopment, on the other hand, will be constrained by the presence of the Usquepaug-Queen River aquifer, wetlands, and prime agricultural land.

"Nevertheless," as Statewide Planning observed in 1990, "the [Ladd Center's] proximity to the University of Rhode Island, its infrastructure, and substantial floor space have made it a prime candidate for conversion to a university research and office park." ((11:4.43)) There is considerable interest at this writing in developing Ladd Center as an eco-industrial park ((87)) and federal Job Corps training site. The latter would be a means of attracting federal funds to the site that could be used to renovate infrastructure.

Hopkinton: The Town of Hopkinton has zoned almost 700 acres in 11 sites for industrial use. Most of this industrial acreage is vacant, and much of what is in active use is in a use that is something other than industrial. Only two of the 11 sites are fully occupied. Five of the sites with vacant land measure five acres or less each. None of the sites have public water, sewers, or natural gas service.

One site, located in Hopkinton southwest of the intersection of Route 3 and Maxson Street, is within the Ashaway aquifer; actually measuring less than an acre, it is nevertheless deemed suitable for small-scale industrial use. Another site, offering two vacant acres and located southwest of the intersection of Tomaquag Road and Colonial Village, has also been suggested for small-scale use.

Other sites suffer a litany of constraints, most being floodprone, rocky or stony-soiled, and relatively inaccessible even though they are within one mile of I-95. This applies to even the larger sites, where considerable vacant acreage is available. Three of the larger sites — at the intersection of I-95 and Alton Road, southeast of the intersection of I-95 and Canonchet Road, and at the intersection of R.I. Routes 91 and 216, respectively — overlie the Wood River aquifer.

The southern portion of the site at I-95 and Alton Road does have some development potential because existing land uses are buffered by the highway, and the soils, at least in part, are suitable. As with other Hopkinton sites, however, its lack of utilities prevent it from being considered "prime." ((8))

Richmond: The Town of Richmond has 627 industrial-zoned acres in total, a decrease of 444 acres from 1988 through rezoning. Acreage in industrial use, on the other hand, has increased ten-fold (239 acres today *vs.* 24 acres in 1988). Vacant industrial acreage has decreased by some 40 percent, from 849 acres in 1988 to 339 acres today. The vacant acreage is scattered among seven of the town's ten industrial sites.

One of the town's largest vacant areas, measuring 91 acres, is located at the site at the intersection of I-95 and R.I. Route 138. Despite excellent highway accessibility, this site has limited potential for large-scale industrial development. (Small-scale distribution facilities may be appropriate, however.) Although public water is available, sewer service is absent. In addition to being a siting constraint, this creates a concern about the potential pollution of the Wood River, which the R.I. Department of Environmental Management classifies "Class B" in this area. Considerable site preparation also appears necessary to remove physiographic obstacles, including some slopes in the three-to-15 percent range, and stony soils evident along the Wood River and its tributary streams.

A site to the north of the above offers 50 vacant acres, but under the same environmental constraints as its neighbor. A third site, at the intersection of Route 138 and Heaton Orchard Road, has 105 vacant acres. This site, particularly the area adjacent to Route 138, appears to have generally suitable soil characteristics, but there are wetlands and flood hazard areas in the western portion that should be avoided. Public water and sewer service are also lacking.

The remaining four sites with vacant land have moderate potential. A site in the Village of Shannock has only four vacant acres and sloping that could be mitigated with some site preparation. Suitable areas appear available at the rest of the sites, but all the sites have floodprone portions. The sites are located at or to the west of the intersection of R.I. Route 91 and Hope Valley Road and account for 30, 20, and 39 vacant acres respectively. That last site is within the Usquepaug/Queen River groundwater aquifer. ((8))

Westerly: With 1,671 acres zoned industrial, the Town of Westerly possesses the largest share of industrial land in Substate Growth Area 6. There are 234 acres in industrial use, 526 acres in some use other than industrial, and 912 undeveloped acres. The town has ten industrial sites, only one of which — located southeast of the intersection of John Street and Beach Street — is fully occupied. All but one site has public water, half have sewers, and all have access to natural gas service.

There are sizable blocks of vacant industrial acreage in Westerly. Three sites contain more than 100 acres of vacant land each. The first is located east of the intersection of Routes 91 and 3 and adjoins the Conrail Mainline tracks, thus having good transportation access. Development of the vacant land, some 140 acres, will principally be limited by soil and topographic conditions (rocky with considerable outcrops) and the presence of several wetlands.

The second of the three sites, at the intersection of Airport Road and Post Road, contains the Westerly Airport Industrial Park and 114 vacant acres. Two large parcels at the eastern and southern portions of the site appear to be generally suitable

for development, although site work would be necessary to correct moderate to steep slopes and stoniness. Smaller vacant parcels on the western side of the site appear to be within wetland areas and have very poorly drained soils.

The third site, Douglas Park, contains a large quantity of vacant land (513 acres) with varying development capabilities. Wetlands and poorly-drained soils occupy a considerable portion of the site, and steep slopes and flood hazards are also present. The site overlies Bradford groundwater aquifer. Adding to these constraints is the lack of sewers on site. On the positive side, much of the site's vacant acreage appears to be quite suitable, physiographically, for large-scale industrial use — provided the site can be developed in an orderly fashion that accounts for its varying capabilities, perhaps under an overall site plan.

Other industrial sites in Westerly have varying development potential. Undeveloped areas within these sites are similar to those described above, in that they typically have flood hazard or soil and topographic conditions that limit development to small subareas within them.

One of these sites is located on R.I. Route 78 at the Connecticut state line, and contains 34 vacant acres among a mixture of industrial and non-industrial uses. The area most conducive to development — on a small scale — is found near the center of the site. Elsewhere, development is limited by floodprone areas and wetlands or rocky soils. The site is fully serviced, however, has reasonable highway access, and rail on site.

Another is located on Ledward Avenue and measures six acres in total, four of which are undeveloped. The site contains small parcels, but physical characteristics make them acceptable for small-scale development. The site's biggest disadvantage is that it lacks sewers, though public water and gas service are available.

A third is located on Franklin Street, adjacent to the Franklin Shopping Center and Route 78. This site is unique in that it is an eight-parcel industrial park that is being developed under a site plan that reserves acreage that would otherwise be unbuildable, or severely constrained, for buffer areas around floodprone and environmentally sensitive areas. The remainder will be divided into parcels ranging from 3.1 to 5.3 acres, giving a total developable area of about 32 acres (which in our inventory are currently classified as "vacant"). The park will be fully serviced, with natural gas and highway and rail access.

The remaining industrial sites have been recommended for rezoning. These are located in Potter Hill and at the intersection of Route 91 and Pound Road respectively. Both have lapsed into non-industrial uses, the Pound Road site having largely become a residential area. ((8))

04-05-06-05: Conclusions

Substate Growth Area 6 presents an interesting challenge: literally thousands of industrial-zoned acres are vacant, but only a single site — the planned industrial park in Westerly — passes muster as "high potential." The remainder is constrained by flood hazards, wetlands, rocky soils, slopes, or lack of utilities. These are features that have to be mitigated, compensated for, or avoided for development to proceed.

Table 212-04(15) and Map 212-04(6) summarize the constraints and development potential of the industrial sites in Substate Growth Area 6.

When one looks closer at the sites, it is obvious that some of them are large enough to allow the skillful avoidance of discrete, environmentally sensitive features, such as river floodplains and wetlands. On the other hand, the presence of groundwater aquifers under many of the sites is a major constraint to any development other than a modest expansion of existing manufacturing, or a low-intensity use such as wholesale trade. Fortunately, this appears to fit our employment projections for the area's manufacturing and wholesale/retail sectors. (Firms specializing in wholesale trade would coincidentally benefit from the generally good access to state and interstate highways in the area.)

In a similar vein, little can be done to mitigate the absence of utilities at most industrial sites in Substate Growth Area 6 other than to dig a well or provide on-site wastewater treatment. This is not to say that utility limitations have prevented industrial use of many of these sites, and considerable non-industrial use as well. However, development can be expected to be limited and even *defined* by the capacities of wells and septic systems, and by the schedule for infrastructure improvements.

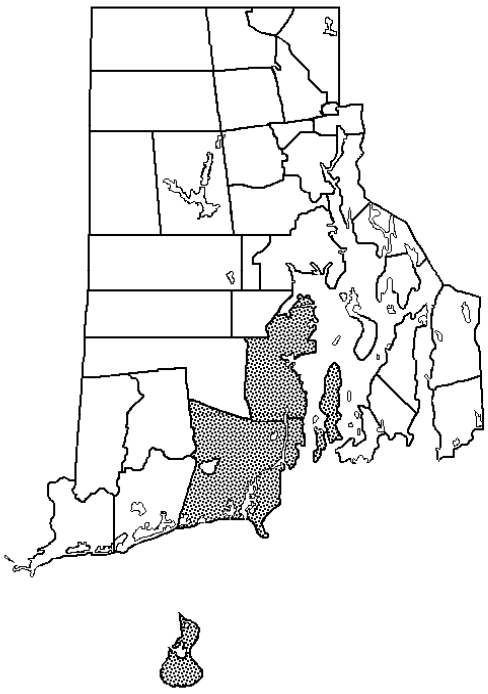
TABLE 212-04(15):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 6

Town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Charlestown	3	1,095	0	0	1,095	0
Exeter [1]	236	0	0	0	0	
Hopkinton	9	465	0	0	163	0
Richmond	10	339	0	0	54	0
Westerly	10	912	864	225	786	32
Total	**33**	**3,047**	**864**	**225**	**2,098**	**32**

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

MAP 212-04(6):
SUBSTATE EMPLOYMENT GROWTH AREA 6

04-05-07: Substate Employment Growth Area 7



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	52,400	83,169	9,946	0.19
1980	59,100	"	16,638	0.28
1985	62,800	"	19,486	0.31
1990	69,237	"	19,154	0.28
1995	68,744	"	21,322	0.31
2000	73,206	"	24,890	0.34
2005	77,485	"	27,416	0.35
2010	81,872	"	29,943	0.37
2015	86,598	"	32,470	0.37
2020	91,933	"	34,997	0.38

04-05-07-01: Demographic Profile

The towns of Jamestown, Narragansett, New Shoreham, North Kingstown, and South Kingstown make up Substate Employment Growth Area 7. The land area encompasses 83,169 acres and supported a population of 68,744 in 1995. The population density of 0.83 persons per acre reflects the area's rural character, though much suburbanization has taken place. The trend is continuing, as Substate Growth Area 7 gained population at a much faster rate than the rest of the state from 1985 to

1995, and is projected to continue growing significantly through 2020. Employment growth is expected to keep up with population growth.

Quonset/Davisville: As in other Substate Growth Areas, the employment projections above are based on a regression analysis. This analysis is based on the pace of past and present use of industrial properties in Substate Growth Area 7, including the Quonset Point/Davisville Industrial Park (now called the "Quonset Davisville Port and Commerce Park") in North Kingstown. The pace may accelerate rapidly if QPD is developed in full as a combined commerce park, intermodal terminal, and seaport. A regression analysis, based as it is on trends, cannot account for a sudden change in employment growth, so our employment projections must be taken as conservative.

As many as 22,000 additional jobs could be generated over a 20-year period at QPD under a scenario calling for the construction of a container port in addition to the other facilities. There are approximately 5,000 people employed in the park today. ((69))

However, the scope of the Quonset project is still a matter of debate, and until all the issues are settled and the plans are finalized, we prefer, for consistency with our projections for the other Substate Growth Areas, to keep basing our employment estimates for Substate Growth Area 7 on patterns of past and present industrial use. If it is necessary to revisit those projections in the near future because of a significant uptick in employment due to Quonset's development, staff will do so and revise them accordingly.

04-05-07-02: Economy

Manufacturing, wholesale and retail trade, and services are the three leading contributors to employment in Substate Growth Area 7, as they are in most of the rest of the state. All three are projected to grow over the next 20 years, with manufacturing leading through 2000, and then being overtaken by both wholesale/retail and services.

Rubber and plastics products (SIC 30) account for most manufacturing employment areawide, followed by instruments and related products (SIC 38) and food and kindred products (SIC 20). Rubber and plastics products and instruments are concentrated in North Kingstown; there, the third largest manufacturing sector is industrial and commercial machinery and computer equipment (SIC 35). Printing and publishing (SIC 27) employ the most in South Kingstown, followed by textile mill products (SIC 22). ((63))

Nondurable goods (SIC 51) lead wholesale trade employment in all communities except North Kingstown and South Kingstown. Wholesale trade employment in Narragansett has shown a steady decline from 1985 to 1995, while growing in Jamestown and North Kingstown. In retail, eating and drinking places (SIC 58) are the top employer areawide, with food stores (SIC 54) second and miscellaneous retail stores (SIC 59) third. Auto dealers and service stations (SIC 55) are

third in North Kingstown. Miscellaneous retail has shown steady growth in Narragansett, New Shoreham, and North Kingstown. ((63))

Health services (SIC 80) are the areawide employment leader in services, concentrated in South Kingstown and North Kingstown; business services (SIC 73) are second, and social services (SIC 83) third. Amusements and recreational services (SIC 79) are third in employment in North Kingstown, and engineering and architectural services (SIC 87) are third in South Kingstown — after health services and social services. ((63))

Our forecast of employment trends in Substate Growth Area 7 through 2020 is summarized below. About ten percent of the wholesale/retail employment is expected to be in wholesale trade. ((64))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	6,832	7,725	8,409	9,093	+2,261
Wholesale/retail	5,156	7,532	9,282	11,031	+5,875
Services	4,950	6,757	8,701	10,644	+5,694

Two of the Substate Growth Area 7 towns are islands: Jamestown and New Shoreham (Block Island). Although each of these communities does contribute to the economy of the growth area, neither has land set aside for industrial use. Our analysis of the area's industrial land use therefore excludes them.

04-05-07-03: Infrastructure

The towns of Substate Growth Area 7 share in common a defining geographic feature: an extensive coastline, along either the western portion of Narragansett Bay or the Atlantic Ocean. Not surprisingly, the area has marine facilities catering to many different types of commercial pursuits, including fishing, import operations, and recreational boating. It is the location of Point Judith in Narragansett, one of the largest commercial fishing ports in the Northeast, and Quonset/Davisville, a decommissioned naval base that is Rhode Island's major industrial park, seaport, and foreign trade zone.

Transportation: Access to an interstate highway can be problematic for industrial sites in Substate Growth Area 7, however. Rhode Island Route 4 and U.S. Route 1 are the main north-south highways. Route 4 links North Kingstown and points south with I-95. The area's east-west corridor is R.I. Route 138, which connects I-95 in the west with Aquidneck Island via the Verrazano Jamestown Bridge and the Pell (Newport) Bridge in the east.

As part of the redevelopment of Quonset/Davisville, which is located in North Kingstown, there are plans to provide better highway access to the park by constructing a limited-access highway from Route 4 to the industrial park. ((80))

Plans for improving highway access to Quonset are coupled with the anticipated improvement of rail access through the construction of a freight-dedicated "third track" to enable freight and passenger rail traffic to travel along the same rail corridor simultaneously. The completion of the "third track," which will run from Davisville to a switchyard in Central Falls, is considered critical to the success of a revitalized Quonset.

The Quonset State Airport within the Quonset/Davisville complex provides the area with a general aviation facility with runways capable of accommodating transport category aircraft as well as corporate and chartered flights. The current layout of the airport may be altered if plans for developing the seaport at the park are implemented.

Water: The utility infrastructure at industrial sites in Substate Growth Area 7 varies from fully serviced areas such as Quonset to areas lacking sewer service and even public water. Where public water is available, it is provided by one of seven separate water systems. Quonset is served by its own system, with a capacity originally designed to service the needs of the U.S. Navy, which began vacating the complex in 1973. The Town of North Kingstown also operates its own system, serving about 90 percent of the town. ((80))

South Kingstown has four different water systems: the South Shore Water District, the Kingston Water District, United Water Rhode Island (formerly the Wakefield Water Company), and, serving itself, the University of Rhode Island. The less developed western portion of South Kingstown lacks public water service. Like neighboring communities in Substate Growth Area 6, this area contains sole source groundwater aquifers in areas with developable industrial land: the Hunt-Annaquatucket-Pettaquamscutt in North Kingstown and the Wood River in South Kingstown. ((11)), ((75)), ((79)), ((80))

Narragansett has no water supply wells of its own. It purchases water from United Water Rhode Island (about 68 percent), the Town of North Kingstown (30 percent), and South Kingstown's South Shore Water District (about two percent, for Jerusalem only). The town will be discontinuing use of North Kingstown water, and increasing its proportion from United Water Rhode Island. ((75))

Sewers: The wastewater treatment infrastructure in Substate Growth Area 7 is not as widely available as public water. Within North Kingstown, for example, sewer service is only available within the confines of Quonset Point/Davisville and in the areas immediately around QPD, such as the Navy housing. ((80)) North Kingstown's industrial sites outside the complex therefore all lack a critical component determining development potential.

The Town of Narragansett has two treatment plants, located in Scarborough and Narragansett Pier. The former (the South End System) serves high-density areas in the southern portion of the town, including the Galilee fishing piers. The latter (the North End System) is actually owned and operated by the Town of South Kingstown, though its service area includes most of central and northern Narragansett. The North End System has capacity limits by agreement with the town's partners, the University

of Rhode Island and the Town of South Kingstown. Narragansett is at its limit in the North End System. The South End System, on the other hand, is at only 50-60 percent capacity, but is limited by its ability to handle very concentrated effluent from Galilee's fish processing plants. Pretreatment programs can be effective, however, in making the unused capacity available to other users. ((75))

Table 212-04(16) reports the use of industrial land in the five communities of Substate Growth Area 7. The additional entry on the table is Quonset Point/ Davisville, which technically is located within the Town of North Kingstown but which has an ownership history, infrastructure, and use characteristics that set it apart from other industrial properties in the town.

04-05-07-04: Site Analysis

Nearly 3,000 acres are zoned industrial in Substate Growth Area 7, more than half of which (1,541, or 52 percent) are vacant. The primary contributor is Quonset/Davisville, which also accounts for the area's large proportion of "high potential" industrial acres — some 36 percent of the state's total.

It is widely believed that this growth area will continue to be a major focus of job expansion in Rhode Island in the years to come, particularly if the ambitious plans for QPD come to fruition. The area's E/P ratio is growing, and is the third highest in the state (behind the Providence metropolitan area, Substate Growth

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TABLE 212-04(16):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 7

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Jamestown	0	0	0	0	0
Narragansett	148	71	67	10	4
New Shoreham	0	0	0	0	0
No. Kingstown	989	266	257	466	0
Quonset/D'ville [2]	1,555	455	120	980	527
So. Kingstown [3]	258	126	47	85	0
Total	**2,950**	**918**	**491**	**1,541**	**531**
State total	32,455	11,116	6,113	15,224	1,485
% state total	9.09	8.26	8.03	10.12	35.76

[1] All values are in acres, with the exception of "% state total." Use totals may differ from total acres due to rounding of fractional acreage to nearest whole number.

[2] Located in the Town of North Kingstown; not a separate municipality.

[3] Does not include the Route 1 Special Management District.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

Area 3, and the heavily industrialized Blackstone Valley, Substate Growth Area 1).

As explained above, our projections, being based solely on trends set from 1975 to the present, did not factor in any *additional* employment from the development of QPD as a larger seaport. This makes the numbers all the more interesting. According to our analysis, even if we discount a major influx of jobs from accelerated port development, the growth trend in Substate Growth Area 7 will continue to the year 2020.

Narragansett: A comparison of industrial acreage from the 1988 and current inventories show some significant changes in use or vacancy in the Town of Narragansett. The most subtle change is that a single acre has been added to the town's industrial land to accommodate communications towers on Westmoreland Street. ((8))

Narragansett's largest industrial site is the fully-serviced South Ferry Industrial Park. It is situated next to the University of Rhode Island Bay Campus, home of the Graduate School of Oceanography, off Ferry Road. The park was designed as a joint venture between the state and local developers to take advantage of the nearby marine scientific facilities. Today, much of the park is occupied by a variety of businesses, few of which are engaged in oceanographic research.

Recent additions to the South Ferry Industrial Park include a water purification system contractor/builder and a major addition to DeWar Industries, an industrial coating firm. The park is essentially built out, with a single vacant parcel of 1.8 acres. Nearly all the vacant land formerly associated with the park has been deeded to the town or to the University of Rhode Island for conservation purposes. ((75))

To the west of the South Ferry Industrial Park is the North Star Industrial Park, also fully serviced, which is being marketed for light industry and warehousing. The site contains 29 acres, most of which are presently occupied. There remain a total of six half-acre vacant lots, all of which would require special use permits to be developed. ((75)) Like the other park, North Star is located within one mile of U.S. Route 1.

Of the remaining three industrial sites in Narragansett, only two have vacant acreage. One serves as one of Rhode Island's main fishing ports, the Galilee area of Point Judith. Galilee is primarily state-owned land near the entrance of Point Judith Pond with berthing facilities for fishing boats. Much of this site serves as necessary laydown and storage areas supporting the fishermen. Industrial uses here must be related to fishing and related industries. Fish processors must plan for pretreatment of waste streams to meet the town's wastewater effluent standards. ((75))

A master plan for more efficient use of the Galilee port area is expected to direct more tourism into Galilee while preserving the fishing industry through infrastructure improvements, including bulkheads, piers, utilities, and roadways. The plan culminates a multi-year effort by the University of Rhode Island, the EDC, Statewide Planning, the DEM, stakeholders in the Town of Narragansett, consultants, and private developers. About four vacant acres remain at this site, a small amount being used for public parking.

The second site is the Narragansett Industrial Park, located at the intersection of R.I. Route 108 and Woodruff Avenue. It is 16 acres in size, with 15.5 acres in industrial use and only 0.5 acres vacant. The park's tenants include firms involved in metal fabricating, wood products manufacturing, warehousing, and fish processing. The vacant acreage seems best suited to an expansion of existing uses.

As mentioned in the discussion of utility infrastructure in Substate Growth Area 7, further industrial development is limited by the town's wastewater treatment capacity. Wastes from the fish processing industry in particular have been a focus of concern, and DEM staff has attempted to engineer a waste minimization program within the industry to limit the amount of waste flowing "downstream" to the treatment facilities. The concept would well be applied to any new industry seeking to locate in Narragansett. ((8)), ((75))

North Kingstown: Excluding Quonset Point/Davisville, the Town of North Kingstown has 989 acres zoned industrial, 266 of which are in industrial use, 257 in non-industrial use, and 466 vacant. These are scattered among 15 sites ranging in size from two acres to 367 acres. The relatively high proportion of non-industrial use may be explained by the lack of sewers in areas of North Kingstown outside QPD. Most sites are further constrained by the presence of groundwater aquifers. ((80))

Seven of the town's industrial sites have vacant acreage. The first, located off Frenchtown Road, measures 155 acres in total, 85 of which are vacant. For years it has been the site of the Brown & Sharpe manufacturing facility, and boasts excellent highway access with links to I-95 via Frenchtown Road and R.I. Route 4. In addition, the site has rail access and favorable soil and topographic characteristics. However, it is also within the recharge area of the Hunt River aquifer. The Brown & Sharpe plant has its own wastewater treatment facility with secondary treatment at the site, but whether additional tie-ins are possible is not known.

Another site measures eight acres, two of which are vacant and apparently best suited to an expansion of existing uses. Located northeast of the intersection of South Road and Old Baptist Road, it is within the Hunt River aquifer Wellhead Protection Area. A third site overlies the Annaquatucket River aquifer and could be developed only with strict restrictions. The site is located on Oak Hill Road at Bellville Pond and is 27 acres in total, with 18 vacant acres. In May, 1998, all industrial properties overlying the aquifer were rezoned "light industrial." ((80))

Most of the acreage of a site northeast of the intersection of Railroad Avenue and Indian Corner Road is expected eventually to drop out of our industrial land inventory. The site is rated as prime agricultural land by the U.S. Department of Agriculture, and it overlies the Chipuxet River groundwater aquifer. It is 182 acres in size, only eight of which are presently occupied (and in industrial use). A portion of this site has been rezoned "rural residential." The remaining acreage is proposed to be similarly rezoned. We presume that only a limited expansion of the existing industrial uses will be possible at this location.

One site with what appears to be considerable potential is located at Dry Bridge Road and Lafayette Road. It measures 367 acres in total, much of which is

vacant or in use for sand and gravel operations. The southwest portion of the site has favorable physical conditions for development; soil conditions and steep slopes in the northern and eastern sections, however, are constraining. Such differing capabilities of the land within this site indicate the need for a coordinated site plan should development proceed. As in other areas of North Kingstown, an important groundwater aquifer (for the Annaquatucket River) is present that might further constrain development.

The remaining two sites with vacant acreage are much smaller, measuring six acres and five acres respectively and each having a single undeveloped acre. The former is within a groundwater aquifer, the latter in a flood hazard zone. The first site, located at Oak Hill Road and Sweet Lane Road, may not be able to support further development as the vacant area is extremely wet. Some expansion of existing industries is possible at the second site, located in the Village of Wickford, but this is within a flood hazard area.

Because all of the industrial sites in North Kingstown outside the Quonset/ Davisville complex lack sewers, as mentioned above, the *Industrial Land Use Plan* excludes them from its list of "high potential" sites. ((8))

Quonset Point/Davisville: The Quonset Davisville Port and Commerce Park is a 2,500-acre industrial complex consisting of 14 industrial sites, ranging in size from 35 to 250 acres. Vacant land exists at each of the sites. All of the sites have public water, but only 11 have sewers. Natural gas service is available at eight of the sites. Rail access is available to all but one of the sites.

Quonset Point/Davisville benefits from the wastewater treatment plant, power plant, port, road system, rail access, and airport, all originally developed by the U.S. Navy and enhanced over the last decade for industrial purposes. The complex also features a free trade zone. The industrial park portion is where the Davisville Naval Construction Battalion Center and Quonset Naval Air Station were formerly located. ((80))

For years, QPD has been refurbished, redeveloped, and marketed as the state's premier industrial park by a quasi-public corporation, the R.I. Port Authority and Economic Development Corporation, which has since been succeeded by the EDC. Whatever comes of the plans for a seaport at QPD, the area will remain important to the economic development of Substate Growth Area 7 and the rest of the state. Tenants will continue to be attracted by its location and development potential. Total employment at the park exceeded 6,000 in early 2000. ((98))

Eight sites have no apparent constraints to development. The first such site encompasses the Kiefer Park area, which has recently been upgraded with new roads and utilities to serve as a technology park. When the industrial land inventory was initially compiled in 1996, 62 of Kiefer Park's 72 acres were vacant; by 1999, only 25 remained so. ((69)), ((98)) The second site, 85 acres in size, is located in West Davisville, and has an active rail siding and 61 vacant acres. Our survey indicates a sewer line extension at the site (an Army Corps of Engineers public works project) was completed in 1997.

The third of the eight sites is 72 acres in size, with 58 in industrial use and 14 vacant. The inventory describes it as "well serviced by both utilities and roads," though it lacks natural gas service and rail access. It is located in South Davisville. The fourth site, in the South Davisville/Mill Creek area, is similar in size and compliment of services, but with 63 vacant acres. (Some of the vacant acreage is located within the right-of-way for the new access road, however.)

The next of the eight sites is presently partially occupied by General Dynamics/Electric Boat. It is a waterfront site measuring 170 acres, adjacent to the Quonset Airport, and well served by rail. Thirty acres are vacant, and further downsizing at Electric Boat is expected to cause some buildings to be turned over to the state for redevelopment.

The last three of the eight sites have sizeable vacant acreage, and were among the most recent conveyed to the state by the U.S. Navy. ((98)) The first of these, in West Davisville, measures 70 acres and is entirely vacant. Sewer extension is either complete or nearly completed. The next site, located in the Administrative Triangle, is 126 acres in size, 32 of which are in non-industrial use and the remainder vacant. This area is planned for institutional/office and community uses. The last of the three is the largest of all, 250 acres in total. Forty acres are occupied by industrial uses and seven by non-industrial uses; the remaining 203 are vacant. Located in the Davisville warehouse area, this site is planned for general industrial and manufacturing activities.

The remaining six sites in QPD have varying intensities of industrial activity and vacant acreage that is constrained by either flood hazards, problem soils, or a lack of sewers.

The first of these six sites, in Central Quonset, is partly occupied by Toray Plastics. It measures 140 acres, with 80 acres in industrial use and 60 acres vacant. Steam is available at the site. Development of a small part of the vacant portion of the site may be limited by the presence of a flood hazard area, however.

The next site, the Davisville Piers, is adjacent to the town marina, and includes two 1,200 ft. piers with a 30 ft. water depth. It measures 71 acres, 55 of which are in industrial use, and the remainder vacant. This is a flood hazard area. Another site, in North Davisville, is partially constrained by a lack of sewers on three of its parcels (although there is excellent potential for sewers to be extended there). More serious, perhaps, is the site's location along the airport approach, which may impose height restrictions on what is built there. This is a relatively large site, measuring 120 acres, 25 of which are in industrial use, 45 in non-industrial use, and 50 undeveloped.

The fourth site with constraints measures 45 acres, 15 of which are in non-industrial use and 30 vacant. A lack of sewers and the presence of a flood hazard characterize this site, a waterfront parcel adjacent to the Davisville Piers and the airport. While there is potential for sewer connection, 15 acres are wetland.

The fifth site was still owned by the Navy at the time of the inventory. It is a large site, some 229 acres, that currently lacks sewers but has excellent potential for connection owing to plans to make it a light/waterfront industrial area. Twelve acres

are presently occupied, split between industrial and non-industrial uses. It is supported by proximity to the Davisville Piers and extensive rail facilities. A small portion of the site is in a flood hazard area.

The sixth site, the Carrier Pier with a 35 ft. water depth, is fully serviced. It is the site of the EDC steam and wastewater treatment plant. Vacant parcels fronting water classified "SB(1)" by the Department of Environmental Management are available for aquaculture. The extent of the flood zone may constrain other types of development. ((8)), ((98))

South Kingstown: The Town of South Kingstown has five industrial sites, three of which are fully occupied. ((79))

The fourth site, located between Kingstown Road (Route 138) and Liberty Lane (Fairgrounds Road), has topography conducive to industrial development, but the presence of Chipuxet aquifer is a constraining factor. It is 160 acres in size, with 19 acres in industrial use, 100 acres in non-industrial use, and 41 acres vacant.

The fifth site, north of the intersection of Route 108 and North Road, contains a sand and gravel operation, a precast concrete plant, and an asphalt plant. The remaining vacant area, 13 acres, consists of poorly drained wetlands that are not favorable for industrial use. ((8))

In •••May 1998, the town rezoned an additional 220-•acre••••• area, located on Route 1 •across from the Washington County Government Center and north of the Wakefield cut-off, for a mixed-use district. Site controls require that 50 percent of the developable property be dedicated to office/industrial use. Fifteen percent of the developable property must be set aside as protected open space. Wetlands occupy half the site and must not be disturbed. Public water and sewer service are available. Owing to its mixed-use rather than strictly industrial designation, this area does not show up in our industrial site inventory, but could be a significant resource — up to 55 acres for office or light industrial use — for the town. ((79)), ((82))

04-05-07-05: Conclusions

Infrastructure is expanding in Substate Growth Area 7 to accommodate trends in economic growth, particularly in manufacturing and most notably in the Quonset Davisville Port and Commerce Park. We have begun to see the extension of sewers into the Town of North Kingstown as a result of upgrades in wastewater treatment at QPD to accommodate that growth. No matter what path is taken regarding QPD's future, industrial activity will continue to gain strength in this growth area because of the presence of that facility.

The draft master plan for QPD proposed land uses at a new port and commerce park as follows: 851 acres developed for manufacturing (45 percent) and distribution industries (55 percent); 40 acres for office use; 584 acres for open space; 514 acres for transportation and utilities; and 204 acres for recreation. A significant container port was proposed in 1998 by private developers, and this proposal was reflected in the master plan. The port plans were withdrawn following more than a year and a half of

controversy, although some reconfiguration of waterfront development to accommodate future port uses is possible. Long-range planning is ongoing. ((98))

As Tables 212-04(16) and (17) indicate, high potential industrial land in Substate Growth Area 7 is concentrated in QPD (527 acres, equipped with utilities and without environmental constraints). An additional eight acres of fully serviced vacant land are found in Narragansett (four of which are high potential).

Throughout Substate Growth Area 7, limitations in infrastructure are a limiting factor, but probably not as much as the availability of water. The whole area, essentially, is served by a sole source aquifer. There is a concern that there will come a time that cumulative drawdowns to support expanding industrial uses will exceed safe levels for sustainability. ((100))

TABLE 212-04(17):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 7

Town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Jamestown	0	0	0	0	0	0
Narragansett 5	10	10	10	0	8	
New Shoreham	0	0	0	0	0	0
No. Kingstown [1]	15	466	466	0	432	0
Quonset/D'ville [2]	14	980	980	667	966	527
So. Kingstown [3]	5	85	25	0	60	0
Total	**39**	**1,541**	**1,481**	**677**	**1,458**	**535**

[1] All areas outside Quonset /Davisville
[2] Located in the Town of North Kingstown
[3] Does not include the Route 1 Special Management District

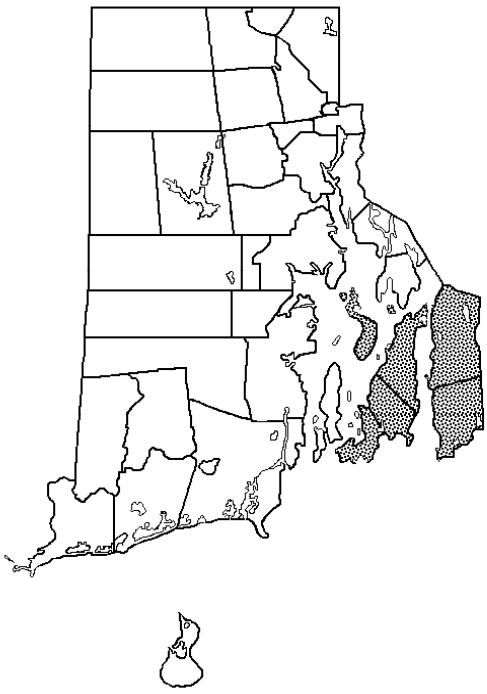
Source: Statewide Planning Program Industrial Land Inventory (1997)

The communities within the growth area have adopted protective mechanisms for aquifers such as overlay districts that will further limit industrial expansion. On the other hand — and as we noted in the original *Industrial Land Use Plan* — other opportunities may present themselves in the siting of less demanding uses such as services and wholesale distribution industries. ((11:4.53-54)) Growth in both those sectors is expected to outpace manufacturing by the year 2010.

Map 212-04(7) shows the industrial development potential of the sites within Substate Growth Area 7.

MAP 212-04(7):
SUBSTATE EMPLOYMENT GROWTH AREA 7

04-05-08: Substate Employment Growth Area 8



Population and Employment Trends

	Population	*Land area, acres*	*Employment*	*E/P*
1975	75,100	60,118	11,619	0.15
1980	77,343	"	19,197	0.25
1985	79,900	"	27,032	0.34
1990	82,195	"	25,367	0.31
1995	81,609	"	24,571	0.30
2000	83,923	"	31,179	0.37
2005	85,771	"	34,387	0.40
2010	87,494	"	37,594	0.43
2015	89,334	"	40,802	0.46
2020	91,528	"	44,009	0.48

04-05-08-01: Demographic Profile

Five communities make up Substate Employment Growth Area 8: Little Compton, Middletown, Newport, Portsmouth, and Tiverton, encompassing Rhode Island's "East Bay." It is one of the smallest substate areas considered in this plan, measuring a little more than 60,000 acres. With a 1995 population of 81,609, its population density is slightly less than the state average at 1.40 persons per acre.

Reversing the trend from 1970 to 1985, the area gained population from 1985 to 1995. The tendency upward is expected to continue. Private employment growth is projected to begin trending upward after 1995, and continue growing as well. In fact, by the year 2020, Substate Growth Area 8 is expected to be second only to Substate Growth Area 3 — the metropolitan Providence area — in the ratio of employment by establishment to resident population (E/P).

04-05-08-02: Economy

As in most of the other substate areas, the three major private employment sectors are services, wholesale and retail trade, and manufacturing.

Transportation equipment (SIC 37), primarily boat building, is the areawide leader in manufacturing, followed by printing and publishing (SIC 27) and apparel and other textile products (SIC 23). Printing and publishing is first in Newport, third in Portsmouth, and fourth in Middletown. Industrial and commercial machinery (SIC 35) is second in Middletown. Instruments and related products (SIC 38), which are fourth areawide, are third in Newport.

Durable goods (SIC 50) are predominant in wholesale trade everywhere but Portsmouth. Eating and drinking places (SIC 58) lead retail employment, followed by food stores (SIC 54) and miscellaneous retail stores (SIC 59). Auto dealers and service stations (SIC 55), ranked fourth areawide, are second in Tiverton and third in Middletown.

Health services (SIC 80) dominate services employment in Substate Growth Area 8, thanks to strong representation in Newport. Engineering and architectural services (SIC 87) are second, being concentrated very heavily in Middletown and Portsmouth. Running third areawide, but leading in Tiverton, are social services (SIC 83). Growth appears to be consistent in health services, on the rebound in engineering and architectural services, and gaining strength in social services, particularly in Portsmouth. Business services (SIC 73), which lead in Portsmouth, are on a downturn elsewhere. ((63))

Our forecast of employment trends in Substate Growth Area 8 through 2020 is summarized below. In the wholesale/retail sector, about six percent of the jobs will be in wholesale trade. ((64))

Major Employment Sectors

Industry	*1990*	*2000*	*2010*	*2020*	*• 1990-2020*
Manufacturing	4,800	4,278	4,138	3,997	-803
Wholesale/retail	6,022	8,228	9,806	11,384	+5,362
Services	11,162	14,886	19,182	23,478	+12,316

04-05-08-03: Infrastructure

The chief geographic feature of Substate Growth Area 8 is its extensive shoreline, taking in all of Aquidneck Island and the coasts of Tiverton and Little Compton. Its boundaries are formed by eastern Narragansett Bay, Mt. Hope Bay, the Sakonnet River, and Rhode Island Sound (the Atlantic Ocean). The area's ports serve numerous commercial fishing operations, Naval training and fleet operations, and recreational boating.

Transportation: This substate area lacks immediate access to interstate highways, with I-195 providing the closest major route to southeastern Massachusetts and the Providence metropolitan area. Rhode Island Routes 114, 138, 24, and 77 are the main north-south corridors. With the exception of Route 24, the roadways support long stretches of residential and commercial development, with some limited industrial development along the way.

The area is no longer serviced by rail freight due to the closing of the Sakonnet River railroad bridge in Tiverton, which linked Aquidneck Island to the City of Fall River, Mass. A number of industrial sites along the western shore of Aquidneck Island abut the rail line and could easily be served if the bridge were brought back on line. Limited passenger rail service is available on the Aquidneck Island line, and there is some discussion of locating a new railway station in Newport near the U.S. Naval Complex.

Substate Growth Area 8 has access to limited commuter and air freight service by way of Newport State Airport, a general aviation facility with 2,600- and 3,000-ft. basic utility runways.

Water: The utility infrastructure in Substate Growth Area 8 varies as one moves away from the urbanized surroundings of Newport to the more rural communities of Portsmouth, Tiverton, and Little Compton. Where available, public water is provided by five separate water systems. The Newport system provides service to Newport, central and western portions of Middletown, and a southern section of Portsmouth. The Portsmouth Water and Fire District serves most of Portsmouth, obtaining some of its supply from the Stone Bridge Fire District in Tiverton. Tiverton is supplied by three water districts in total — the Stone Bridge Fire District, the Tiverton Water Authority which is currently managed by the Stone Bridge Fire District, and the North Tiverton Fire District. These provide public water to limited areas in northern and eastern Tiverton and Stone Bridge. ((11)), ((73))

Quality and quantity of water are a recurring concern, especially on The Aquidneck Island. The shallowness of Newport's reservoirs affects the quality of the supply. Portsmouth's infrastructure and ability to purchase additional supply are limited, and the town depends heavily on the Stone Bridge Fire District in Tiverton and the Newport Water Department.

Sewers: The availability of sanitary sewers is limited to Newport and western and central portions of Middletown. Within Portsmouth, a few industrial facilities

utilize package wastewater treatment facilities. The Melville area, the site of boat building yards and marinas, is served by the Newport Wastewater Treatment Plant via the U.S. Navy. ((72))

Other communities lack sewers, and, in many areas, high water tables and unfavorable soil conditions limit the effectiveness of individual sewage disposal systems (ISDSs). ((11))

04-05-08-04: Site Analysis

More than 4,100 acres are zoned industrial in Substate Growth Area 8, about 13 percent of the state's total. However, only 850 acres are currently used by industry. Non-industrial uses occupy 918 acres. While there appears to be a deep pool of vacant industrial land, 2,348 acres, only 25 acres – less than two percent – is considered "high potential." Poor soil conditions and a lack of sewers constrain development potential.

A summary of uses of industrial land in the growth area is presented in Table 212-04(18). This is followed by a community-by-community analysis of industrial sites.

Little Compton: The 1990 *Industrial Land Use Plan* reported:

TABLE 212-04(18):
SUMMARY OF INDUSTRIAL-ZONED LAND,
SUBSTATE EMPLOYMENT GROWTH AREA 8

Town	*Total* [1]	*Industrial use*	*Other use*	*Vacant*	*Vacant/high pot.*
Little Compton	0	0	0	0	0
Middletown	504	104	242	158	25
Newport	569	297	270	2	0
Portsmouth	1,063	367	237	459	0
Tiverton	1,980	82	169	1,729	0
Total	**4,116**	**850**	**918**	**2,348**	**25**
State total	32,455	11,116	6,113	15,224	1,485
% state total	12.68	7.65	15.02	15.42	1.68

[1] All values are in acres, with the exception of "% state total." Use totals may differ from total acres due to rounding of fractional acreage to nearest whole number.

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

> Little Compton has designated only one site for industry. The development of this site has always been questionable inasmuch as it lacks infrastructure and good transportation access, and contains wetlands and flood hazard areas. Over the years, residential development has continued to occur in this district, further limiting a compatible siting of industry. ((11:4.58))

The plan recorded that the site, measuring 223 acres, had no industrial uses resident upon it, and that 92 acres had already been devoted to non-industrial use. That lone site disappeared from our latest statewide inventory of industrial sites, so we presume it was appropriately rezoned. ((8))

Middletown: The Town of Middletown has three industrial sites, all fully serviced with utilities, including natural gas. One of the sites, located at the intersection of Valley Road and Aquidneck Avenue, stands out as one of Rhode Island's best examples of a modern industrial park: the Aquidneck Island Industrial Park. It is fully occupied with companies employing more than 2,000 people in computer programming and related technical services. In the 1980s and early 1990s, these firms supported the island's array of defense industries; more recently, as defense contracts waned, they were targets of "conversion" efforts promoted by the University of Rhode Island, Statewide Planning's Office of Strategic Planning, and the EDC. As of the most recent inventory, 94 acres are in industrial use, 12 acres in non-industrial use, and zero acres vacant and undeveloped.

Another industrial site, the largest in Middletown at 373 acres, is occupied in large part by the Newport State Airport. While the site includes 133 vacant acres, wetlands, a high water table, lack of accessibility, irregularly shaped parcels, and proximity to residential areas limit further development. On the other hand, the availability of utilities may make limited development feasible, and proximity to the airport is a plus. Only ten acres are in industrial use; 230 acres are in non-industrial use, and the remainder vacant.

The third Middletown site was formerly classified "fully occupied," having served as a R.I. Public Transit Authority (RIPTA) garage and yard. It is currently vacant, and accounts for 25 acres of industrial land. There are no apparent natural constraints to further development. ((8))

Newport: The City of Newport, long known as a tourist or yachting destination and playground of the rich, has but three industrial sites — two of which are in full industrial use and fully occupied, and the third mostly in non-industrial use with only two undeveloped acres remaining. All three sites are fully serviced and located along Coddington Highway.

The latter site, zoned both industrial and commercial, measures 281 acres. Non-industrial use occupies 270 acres. Its single vacant lot abuts a residential zone and is most likely to be developed for non-industrial use also, due to its location. ((8))

There is an effort active in the city to create some 50,000 sq. ft. of new industrial space, the Halsey Street Industrial Park Expansion Project. This space would affect an area known as the City Yard, providing better access for truck traffic and

permitting expansion of the area's industrial use. If the project is successful, the new industrial park is likely to be the focus of future light industrial development in Newport, as the other option is so limited. Development may be constrained, however, by the presence of wetlands and a floodplain. ((70))

Portsmouth: Although most of the Town of Portsmouth lacks the necessary infrastructure usually associated with industrial location at nearly all its industrial sites — i.e., sewers — it has set aside and uses far more industrial acreage than its East Bay neighbors. This acreage is distributed among ten sites, ranging in size from 11 to 464 acres. Of these ten sites, eight have vacant land. All eight have natural gas service, but none have sewers. None of the sites appear to have soil or topographic constraints, or flood hazard areas.

The first site is located on Willow Lane. It is the largest of the eight sites, and has substantial vacant industrial land. Of the 464-acre total, 32 acres are in industrial use, 182 in non-industrial use, and the remainder vacant. This site contains a 620,000-sq. ft. former wire manufacturing plant that is scheduled for conversion to a hotel/convention center, a large pier, and a 250,000-sq. ft. facility that will be used in part for boat building. The remainder of the Willow Lane area is vacant. Rail service is available on site.

The town is considering rezoning this area from "heavy industrial," which is neither compatible with the area nor likely to locate there, to a zone for light industrial (including boat building and related uses), research and development, office, and tourism-related uses. ((72))

The second site is one of a handful located along the eastern side of R.I. Route 114, and abuts the northern portion of the Newport Reservoir. Measuring 34 acres in total, it is roughly split between non-industrial use and vacancy. Its proximity to the reservoir would appear to make it an inappropriate site for industrial development.

Three other sites along Route 114 are found at three separate points at the intersection of the highway with Hedley Street. The first of these, located to the northeast of the intersection, is a ten-year-old light industrial park some 49 acres in size with 22 vacant acres. Available buildings measure 34,000 sq. ft. and 12,000 sq. ft. respectively. The second site, at the southeast corner, measures 41 acres, none of which are in industrial use, four of which are in non-industrial use, and the remainder vacant. Industrial development is constrained by the classification of these vacant acres as prime agricultural land. The third site, at the southwest corner, measures only 11 acres. Two of these are committed to office condos and the remainder are vacant. Rail service is available at this site.

Just south of the Hedley Street/Route 114 intersection is a site measuring 39 acres, six of which are in non-industrial use and the remainder vacant. The vacant acreage is classified "prime agricultural," constraining further industrial development.

A site south of the intersection of Schoolhouse Lane and Route 138 accommodates some light industry as well as non-industrial use. The site is 91 acres in size and contains 59 vacant acres. However, the R.I. Agricultural Preservation

Commission has purchased development rights to the vacant area in the southern portion of the site, and the remainder has been classified "prime agricultural."

North of the intersection of Schoolhouse Lane and Route 138 is another site, measuring 43 acres. This site has only one acre in industrial use, 11 acres in residential use, and 31 acres vacant. The vacant acreage is of moderate development potential. ((8)), ((72))

Tiverton: The Town of Tiverton has four industrial sites, all limited by both environmental constraints and a lack of sewerage. These four sites, however, comprise the largest industrial land resource in Substate Growth Area 8, totaling nearly 2,000 acres. Vacant areas at the individual sites range in size from nine acres to 1,146 acres, and the options for development forced by the natural constraints vary accordingly.

The first site is located at the intersection of Bay Street and State Avenue. It is 24 acres in size, and has ten acres in industrial use, four acres in non-industrial use, and ten acres vacant. The vacant parcel adjoins the coastline and is largely within a flood hazard area. The second site, southeast of the intersection of State Avenue and Shove Street, is about twice as large, with 24 acres in industrial use and 15 in non-industrial use. The remaining, vacant acreage consists of poorly drained soils not conducive to industrial development.

The third Tiverton site is much larger, measuring 626 acres. It is located north of the intersection of Eagleville Road and Route 24. There is no industrial use represented at this site, and 62 acres are in non-industrial use. This leaves 564 vacant acres, the majority of which are occupied by a cedar swamp and areas of steeply sloping, shallow soils interspersed with rock outcrops. These conditions make large-scale industrial development at this site unlikely in the foreseeable future.

The greatest potential lies with the fourth site, located at the intersection of Fish Road and Souza Road and near Routes 138 and 24. The site is 1,282 acres in size, with 48 acres in industrial use, 88 acres in non-industrial use, and over 1,100 acres vacant. About 200 acres located immediately east of Route 138 appear to be most conducive to development. The topography is moderately sloping and soils are stony, but soil drainage is generally good and development would be feasible with appropriate site treatment. East of Route 24, soil and topographic conditions are less favorable to development, with rocky land and moderately drained soils predominating. ((8))

Within this last site is the Tiverton Industrial Park, one tenant of which is the Tiverton Power Associates' (TPA) electric generating plant. The TPA found the site attractive because of the easy availability of natural gas service (a pipeline right-of-way abuts the property) and nearby tie-ins to the existing power distribution network. Highway access is also excellent. The TPA broke ground for its plant in October, 1998, and construction of the main road into the industrial park is proceeding. The town will be amending its Master Plan (comprehensive plan) for additional lots in the park. ((73))

04-05-08-05: Conclusions

Quantitatively, as demonstrated in Table 212-04(19), Substate Growth Area 8 appears able to make only a very modest contribution to the state's store of vacant, high-potential industrial sites. Qualitatively, however, there are greater possibilities. For example, there are empty industrial facilities in Portsmouth (described above) with convenient rail and waterfront access that could be attractive sites for light manufacturing, with the appropriate buffering to lessen impacts on nearby residences. Similarly, the airport area in Middletown might be ideal for distribution industries or the assembly of low-volume, high-value goods. Business services and other low-impact industries might also thrive at such locations. On-site wastewater treatment would be required, however.

Lack of sewers is responsible for the zero reading in the last column of Table 212-04(19) for most of the industrial acreage in Substate Growth Area 8. There are also flood hazards and topographic concerns scattered among the industrial sites. However, two of the greatest conflicts with industrial development are not depicted in the table. They result from the desirability to protect the prime agricultural lands that overlay many of these sites, and the market's push to convert some of the sites to residential or commercial use. There seems to be a need to protect existing industrial land in the area, but infrastructure deficiencies and the apparent increase in non-industrial use of that land do not readily offer a solution.

TABLE 212-04(19):
VACANT INDUSTRIAL ACREAGE CHARACTERISTICS,
SUBSTATE EMPLOYMENT GROWTH AREA 8

City or town	*Industrial sites*	*Vacant acres*	*w/Water*	*w/Sewer*	*w/Rail*	*w/Utilities & No Env. Constr.*
Little Compton	0	0	0	0	0	0
Middletown	3	158	158	158	0	25
Newport	3	2	2	2	2	2
Portsmouth	10	459	459	0	259	0
Tiverton	4	1,729	1,729	0	10	0
Total	**20**	**2,348**	**2,348**	**160**	**269**	**27**

Source: Statewide Planning Program Industrial Land Inventory (1997-99)

One bright spot is the renewed interest in developing the Tiverton Industrial Park, including, of course, the extension of sewers into the area. As this site has the highest industrial development potential in town — with a large, vacant area and highly favorable location — fitting in this "missing piece of the puzzle" seems to be a wise targeting of resources.

Another is the choice of Portsmouth by Raytheon to be the site of the consolidation of some of that company's engineering and research and development facilities. Some 400-600 engineers and high-tech jobs will be transferred there in 1999. ((72))

Also in Portsmouth, the boat building industry in the Melville area has grown so much in the past decade that is has built that area to capacity. ((72))

Finally, the Navy is cleaning up the fuel tank farms in Portsmouth and Middletown. It will most likely begin the process of surplusing those areas within the next few years, making over 350 acres of fully-serviced, "prime" waterfront sites available for development. The sites will show up on future industrial site inventories. The three Aquidneck Island communities, along with the Navy and the EDC, are developing a master plan for the area. ((72))

The industrial development potential of the industrial sites in Substate Growth Area 8 are shown in Map 212-04(8).

MAP 212-04(8):
SUBSTATE EMPLOYMENT GROWTH AREA 8

04-06: Capacity of Rhode Island's Industrial Land Resources to Sustain Growth

In Part Two of the *Industrial Land Use Plan,* Statewide Planning Program staff established a goal to dedicate more than 20,000 acres of industrial land to industrial use, to sustain economic growth through the year 2020. Folded within this acreage is an 8,000-acre reserve to cover such contingencies as employment estimates that turned out too conservative, varying models and methodologies to predict the amount of land needed, and different ways of interpreting trends and data. That reserve is over and above the pool of high-potential industrial acreage we have described here, substate area by substate area.

04-06-01: "Prime" and Not-so-prime Acreage

If we look beyond the high-potential (or "prime") acreage, it appears that we do have more than enough vacant industrial acreage to meet the goal, but the quality of that acreage varies from moderate to marginal to unbuildable. We might also expect competition among likely users for some of the most attractive industrial sites or underutilized facilities in accordance with fluctuations in the real estate market, with conversion to non-industrial use resulting.

One front on which this is likely to occur is Narragansett Bay, including the Seekonk River, the Sakonnet River and Mt. Hope Bay. Along this coastline, there are 27 industrial sites totaling 4,081 acres. Our inventory showed 1,847 acres vacant, only 50 acres of which are classified IDP-3. The vast majority of this vacant acreage is of moderate potential, i.e., IDP-2 – some 1,765 acres. However, flood hazards or other physiographic constraints are present on all but 258 IDP-2 acres, suggesting that this land will have to be managed carefully to be matched to an appropriate industrial use (perhaps in the marine trades?).

Our calculations in Part Two presumed that the state's future industrial activity will be located on industrial-zoned land that is already occupied and in industrial use, or may at present be vacant but has good access, full utilities, and few if any physiographic constraints to hamper development. What remains when this land is taken out of the inventory are sites that are small and scattered, lack public water and/or sewers, abut or overlie wetlands, have poorly drained soils or difficult slopes, are surrounded by residential areas, or have virtually no access to highways.

Whether this land is located along the Bay, the south shore, or inland, the costs associated with making these sites competitive industrial locations can be substantial. Improving access or extending infrastructure in many cases may not even be realistic. Requirements for site buffers and operational constraints for protecting natural resources may reduce the amount of developable acreage. Redeveloping old mill buildings and other previously occupied properties will extend industrial use somewhat, but cannot provide the space we will need *in toto.*

04-06-02: Infrastructure

Infrastructure improvements can make a difference, creating new industrial land that satisfies definitions of "prime" and "high potential." For example, the latest industrial land inventory indicated there were 15,224 vacant industrial-zoned acres throughout the state. Of these, 901 acres have no physiographic constraints but lack public water and/or sewers. Put another way, infrastructure extension could convert these 901 acres into new prime industrial land.

Also among the 15,000-plus vacant industrial acres are sites with physiographic constraints. This is a substantial fraction of Rhode Island's vacant industrial acreage: 11,032 acres, or about 72 percent. Providing public water and sewerage to these sites, if lacking, will not render them prime; considerable site preparation may be necessary for development, and costs or regulatory requirements may be prohibitive. On the other hand, it may be possible to accommodate light industrial activity on such land through designs that avoid, or mitigate, any undesirable impact on sensitive natural features. Through the permitting process, this would be determined on a case-by-case basis.

It also must be mentioned that even if infrastructure extension could be accomplished in a given area, the capacities and level of treatment of the local treatment plant may limit the number of tie-ins, or the nature of the industry served. Pre-treatment at the industry level may be required to permit certain types of industrial activity within an area served by sewers.

Improved transportation access, such as R.I. Route 99 to the Highland Industrial Parks in Woonsocket and Cumberland or the Route 295 beltway around the greater Providence area can open up additional sites for industrial development. However, the severest access problems remain in urban areas, where older industrial properties tend to be surrounded by non-industrial and even conflicting uses.

Recent anti-sprawl initiatives, from brownfields legislation to the founding of Grow Smart Rhode Island, are forcing reconsideration of the older industrial sites as homes for new businesses. "Opening up sites" does not have to mean opening up greenfields (undeveloped lands) to development; it can be directed toward the older sites to make them more accessible by modern modes of transportation. Indeed, access improvements are essential in many instances where older sites are to be reused, or at least to be better utilized than they are now. The sewers and public water usually are already available.

Economic development practitioners have set their sights on firms in the "New Economy." Such firms often can be accommodated in rehabilitated mill space because of the nature of their work and the typical office-type work setting they require. Traditional aspects of infrastructure, insofar as they address highway access or public water or sewer availability, would not figure as importantly as they would in a manufacturing use; wastewater, typically, would be of the domestic rather than the process variety. What would be important, however, is the telecommunications infrastructure. Fiber optic networks may well become the defining element of infrastructure in the twenty-first century.

Throughout the Blackstone Valley, in Massachusetts and Rhode Island, fiber optic networks are being expanded to meet the demand – and accommodate the re-

occupation of former mills and other urban sites (Worcester is a good example) with firms selling goods and services reliant on electronic commerce. This has also proved a boon for local colleges and universities, and for home offices not located on industrial land. Communities without fiber optic capability are increasingly at a disadvantage.

As the years go on, electronic commerce grows, and the telecommunications revolution continues, access to fiber optic networks is likely to become more and more of a determinant of development potential – even in manufacturing – than what we normally think of when we speak about infrastructure. The authors of a future *ILUP* would be well advised to address fiber optics, too, in an industrial site inventory.

04-06-03: Permitting

Because so many of the state's industrial sites are marginal, development will often require some degree of site preparation — and one or more environmental permits. The permitting process, from the determination of what type of permit is required to the finalizing of mitigation measures, adds to development time and costs. Developers should plan for them and must recognize them as a necessary cost of doing business. Regulators should make themselves as customer-friendly as possible without betraying the intent of their regulations, and be forthright in explaining what developers need to do to get their permits. Delays that could have been avoided with better communication between the two parties might make the difference between a viable project and a losing one.

04-06-04: Protecting and Reserving Industrial Land

Finding vacant land of suitable size for "the next Fidelity" or "the next Electric Boat" will become increasingly difficult as we approach the year 2020. A perusal of our industrial site inventory shows that a great many sites with vacant acreage are constrained by environmental factors. On the other hand, some of these sites have industrial *space* (i.e., buildings) that is not occupied to capacity. There is some expansion capability there. Given the continuing growth of the service sector, reconfigurations of existing buildings on site could accommodate many of the jobs we project Rhode Islanders will hold in 2020.

It is therefore essential that this space be considered as valuable a commodity as heretofore undeveloped industrial land, and be protected against a reversion to a "higher use" such as commercial or residential. There are attempts by sources outside the real estate industry to inventory and categorize industrial buildings to prepare for reoccupation and reuse, but these efforts will require diligence to keep such lists up to date and useful. Because of its very fine scale and specificity, an inventory of industrial buildings cannot just be assembled, and then updated every year or every couple of years, as Statewide Planning has done with our inventory of industrial land.

The development potential of industrial land is easily compromised by the threat of conflict with competing incompatible uses. This is often the case in communities that permit uncontrolled residential or commercial use in industrial-

zoned districts. Hopefully, some of the pressures in that area have eased in Rhode Island with the advent of the community comprehensive plans. Even so, real estate market pressures may allow controls to "slip" a bit, special exceptions to be granted, and industrial lands to be reused for other purposes for no compelling reason other than there was a buyer who was interested, and a property that was available. Local officials must be sensitive to land use conversion and recognize the contribution that their individual community makes to the economic infrastructure of the state as a whole.